

SONY.

COLOR VIDEO CAMERA

BVP-7AP



BETACAM™

MAINTENANCE MANUAL

1st Edition

Serial No.43401 and Higher

SAFETY RELATED COMPONENT WARNING

Components identified by shading and Δ marked on the schematic diagrams and parts list are critical to safe operation. Replace these components with SONY parts whose part numbers appear as shown in this manual or in supplements published by SONY.

X-RAY RADIATION WARNING

Be sure that parts replacement in the high voltage block and adjustments made to the high voltage circuits are carried out precisely in accordance with the procedures given in this manual.

Warning—This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a computing device pursuant to Subpart J of Part 15 of FCC rules.

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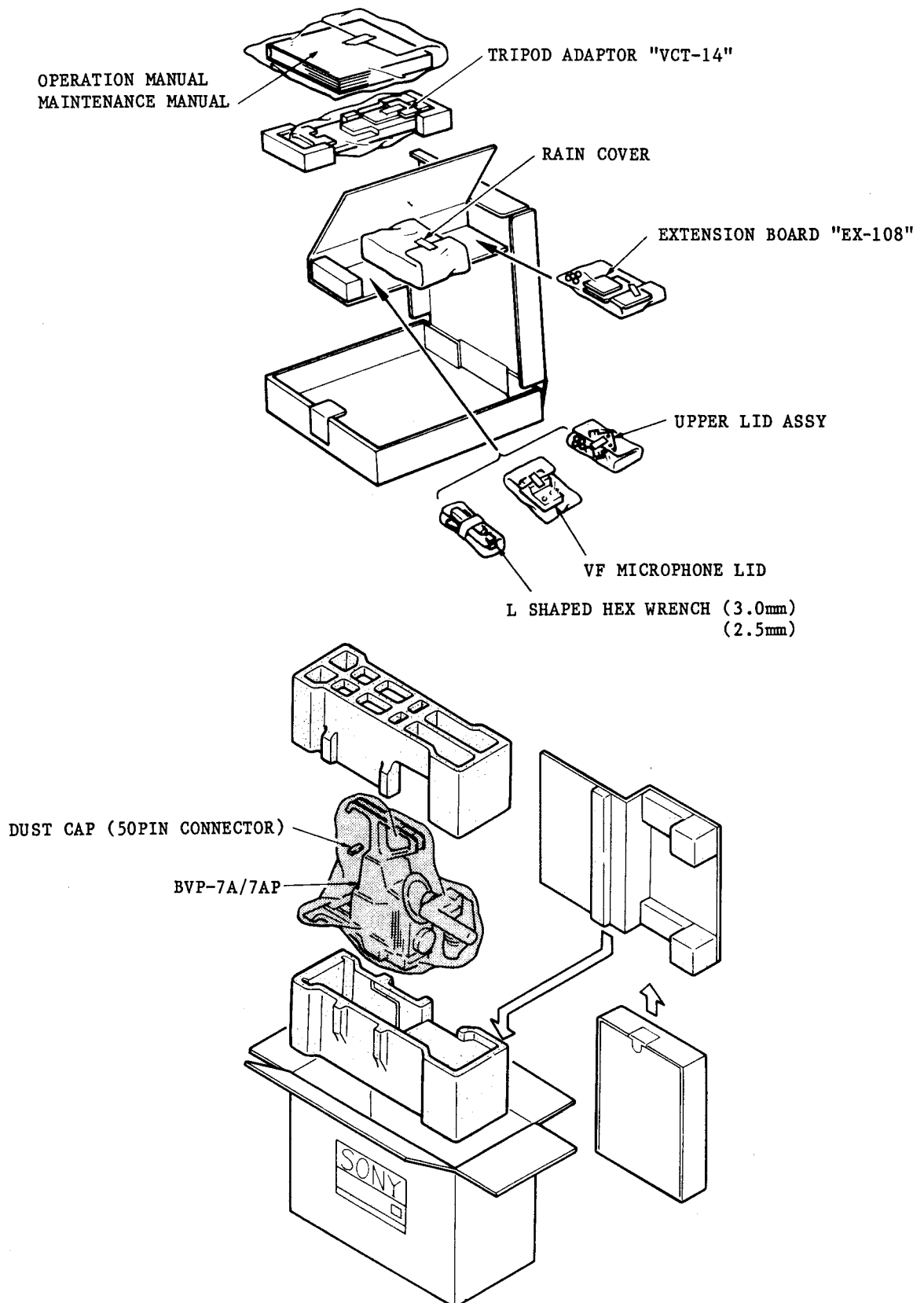
CCD Block	C-2
VA-121	C-12
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SECTION 1 INSTALLATION

1-1. UNPACKING AND REPACKING

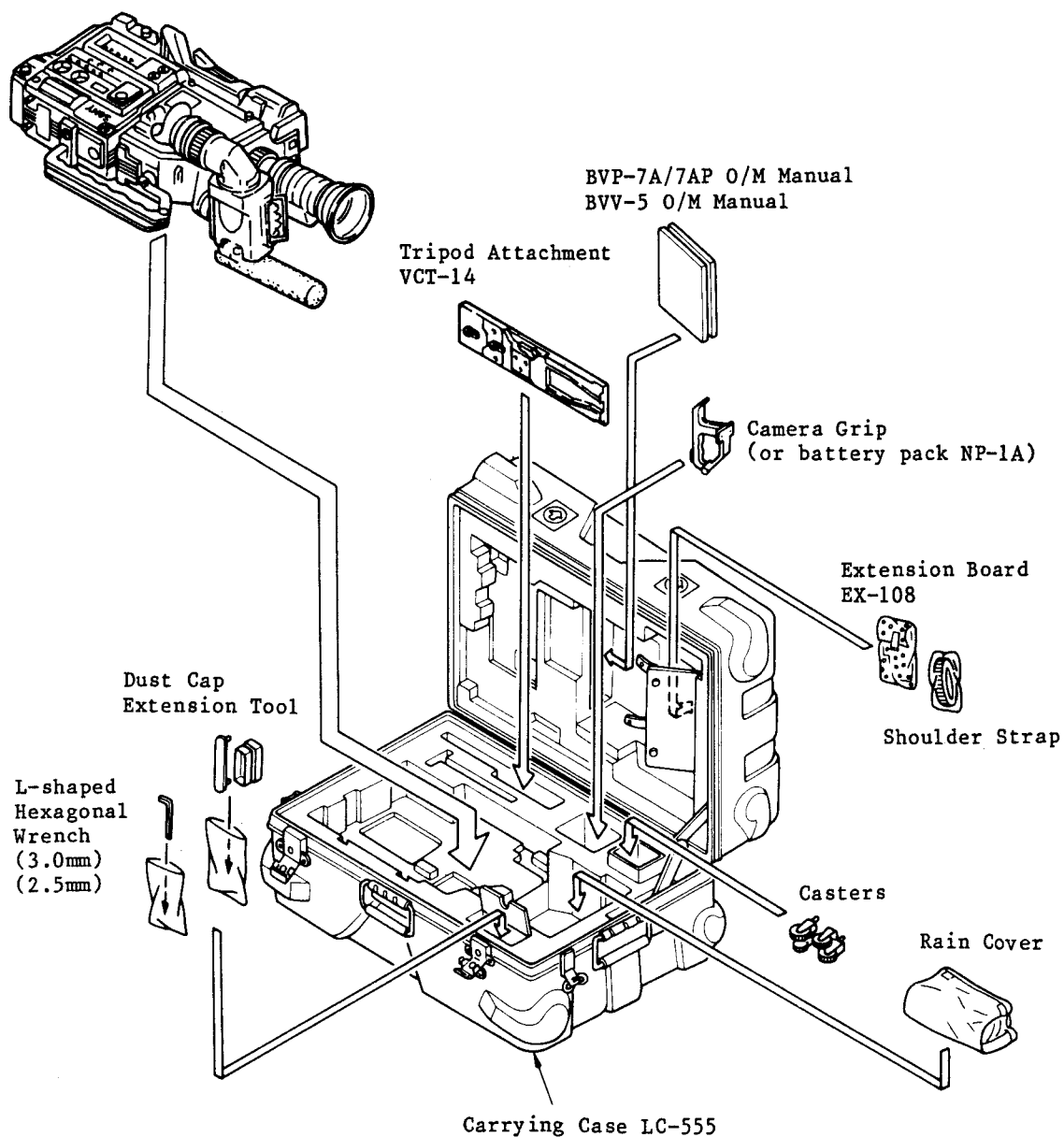


BVP-7A (UC)
BVP-7AP (EK)

1-2. REPACKING IN CARRYING CASE

The camera and VTR can be stored in the carrying case with the lens and viewfinder attached. This will protect the camera from the damage caused by outside pressure.

BVP-7A/7AP
BVV-5/5PS
(with VTR grip attached)

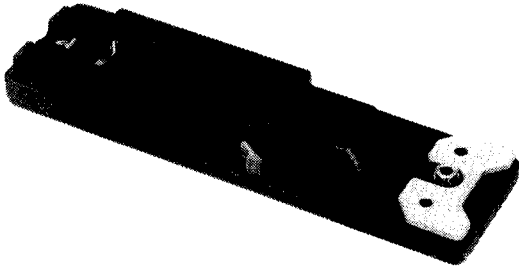


1-3. SUPPLIED ACCESSORIES

- . Tripod attachment "VCT-14": x 1

(Optional accessory)

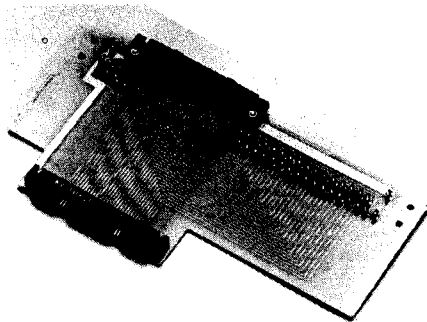
This is the fixed mount for the attached camera at the tripod.



- . Extension Board "EX-108": x 1

(Sony Parts No. A-7520-253-A)

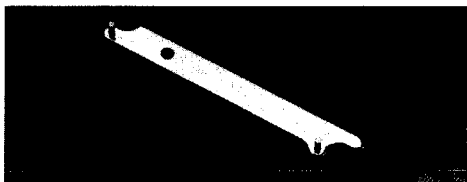
Use this for the check and repair of the main printed boards. (IE-25A/25AP board, VA-121 board, PR-138D/138E board, EN-69/69P board, and PS-173 board)



- . Extension tool: x 1

(Sony Parts No. 3-692-589-01)

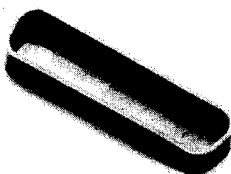
Use this when pulling out the printed board in the card rack.



- . 50-Pin connector: x 1 Dust Cap

(Sony Parts No. 3-675-930-00)

Use to protect the 50-pin connector from dust.



- . Rain cover : x 1

(Sony Parts No. 3-711-780-01)

- . L-shaped Hexagonal wrench (2.5mm): x 1

(Sony Parts No. 7-700-736-04)

(3mm) : X 1

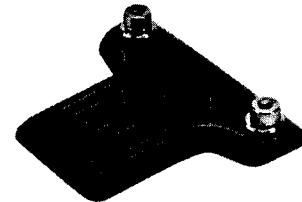
(Sony Parts No. 7-721-140-60)

Used for fixing or removing screws of the handle assy.



- . Upper LID ASSY : x 1

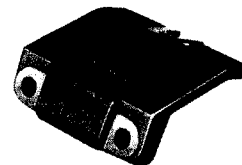
(Sony Parts No. X-3710-001-3)



- . VF Microphone Lid : x 1

(Sony Parts No. 3-720-955-02)

When the supplied microphone is detached from the viewfinder, attach this to protect the viewfinder from rain.



- . Operation Manual : x 1

Instruction manual for BVP-7A/7AP.

- . Maintenance Manual : x 1

Service Manual for BVP-7A/7AP.

1-4. CONNECTORS/CABLES

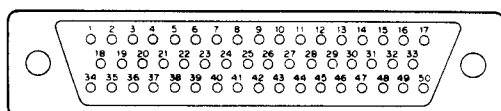
1-4-1. Connector Input/Output signals

The main connector input/output signals are as follows;

TEST OUT VS signal 1Vp-p

$Z_o = 75$

50-PIN CONNECTOR



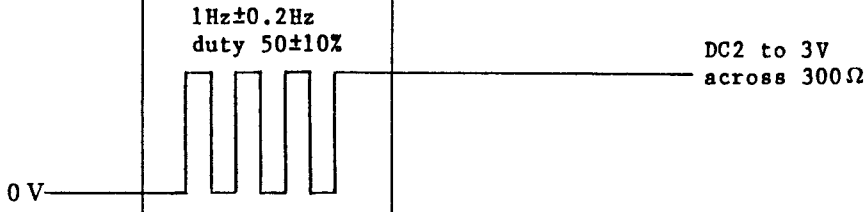
(EXT VIEW)

PIN No.	SIGNAL	REMARK FOR SIGNAL
1	GEN LOCK IN (X)	VBS 1 Vp-p, $Z_i = 1\text{ k}\Omega$
2	GEN LOCK IN (G)	
3	+8.8 V OUT	REG (+8.8 V)
4	-5.0 V OUT	REG (-5.0 V)
5	UNREG (GND)	GND for UNREG
6	UNREG (GND)	
7	R VIDEO OUT (X)	V 0.7 Vp-p, $Z_o = 75\Omega$
8	G VIDEO OUT (X)	
9	B VIDEO OUT (X)	
10	RGB VIDEO OUT (G)	GND for R, G, B VIDEO
11	(Spare)	
12	(Spare)	
13	(Spare)	
14	SD IN/OUT	Serial data for camera control
15	MIC OUT (G)	$Z_o \leq 600\Omega$, -60 dBm balanced
16	MIC OUT (X)	
17	MIC OUT (Y)	
18	RET VIDEO IN (X)	V 0.7 Vp-p, $Z_i = 1\text{ k}\Omega$
19	RET VIDEO IN (G)	
20	ZEBRA/AUDIO IN	AUDIO $Z_i \geq 1\text{ k}\Omega$
21	(Spare)	
22	TAPE IND 2 IN	ON: +4.5 V, OFF; GND or OPEN
23	TAPE IND 1 IN	

PIN No.	SIGNAL	REMARK FOR SIGNAL
24	REC ALARM IN	ON: +5 V, OFF: +2.5 V or 0 V, $Z_i \geq 20 \text{ k}\Omega$
25	BATT IND IN	Note 1), $Z_i = 300 \Omega$
26	PB REF IN	PB: +4.5 V, CAM: 0 V or OPEN
27	VTR START/STOP OUT	Note 2), $Z_o \leq 10 \text{ k}\Omega$
28	(Spare)	
29	R-Y VIDEO OUT (X)	V 0.7 V _{p-p} , $Z_o = 75 \Omega$ (BVP-7A)
30	R-Y VIDEO OUT (G)	V 0.525 V _{p-p} , $Z_o = 75 \Omega$ (BVP-7AP)
31	AUDIO CONT OUT	0 V (0 dB) ~ 7 V (-20 dB)
32	VTR SAVE OUT	SAVE: +4.5 V, STAND BY: 0 V, $Z_o \leq 10 \text{ k}\Omega$
33	AUDIO MONITOR IN	No connection
34	SYNC (VTR) OUT	5 V _{p-p} , Negative pulse, $Z_o \leq 100 \Omega$
35	(Spare)	
36	SHUT CLOSE IN	No connection
37	CF OUT	Color Framing
38	RET VIDEO ENABLE OUT	ENABLE: 0 V, DISABLE: +5 V or OPEN
39	UNREG IN	+10.6 V ~ +17 V
40	UNREG IN	
41	Y VIDEO OUT (X)	VS 1.0 V _{p-p} , $Z_o = 75 \Omega$
42	Y VIDEO OUT (G)	
43	VBS OUT (X)	VBS 1.0 V _{p-p} , $Z_o = 75 \Omega$
44	VBS OUT (G)	
45	(Spare)	
46	(Spare)	
47	(Spare)	
48	(Spare)	
49	B-Y VIDEO OUT (X)	V 0.7 V _{p-p} , $Z_o = 75 \Omega$ (BVP-7A)
50	B-Y VIDEO OUT (G)	V 0.525 V _{p-p} , $Z_o = 75 \Omega$ (BVP-7AP)

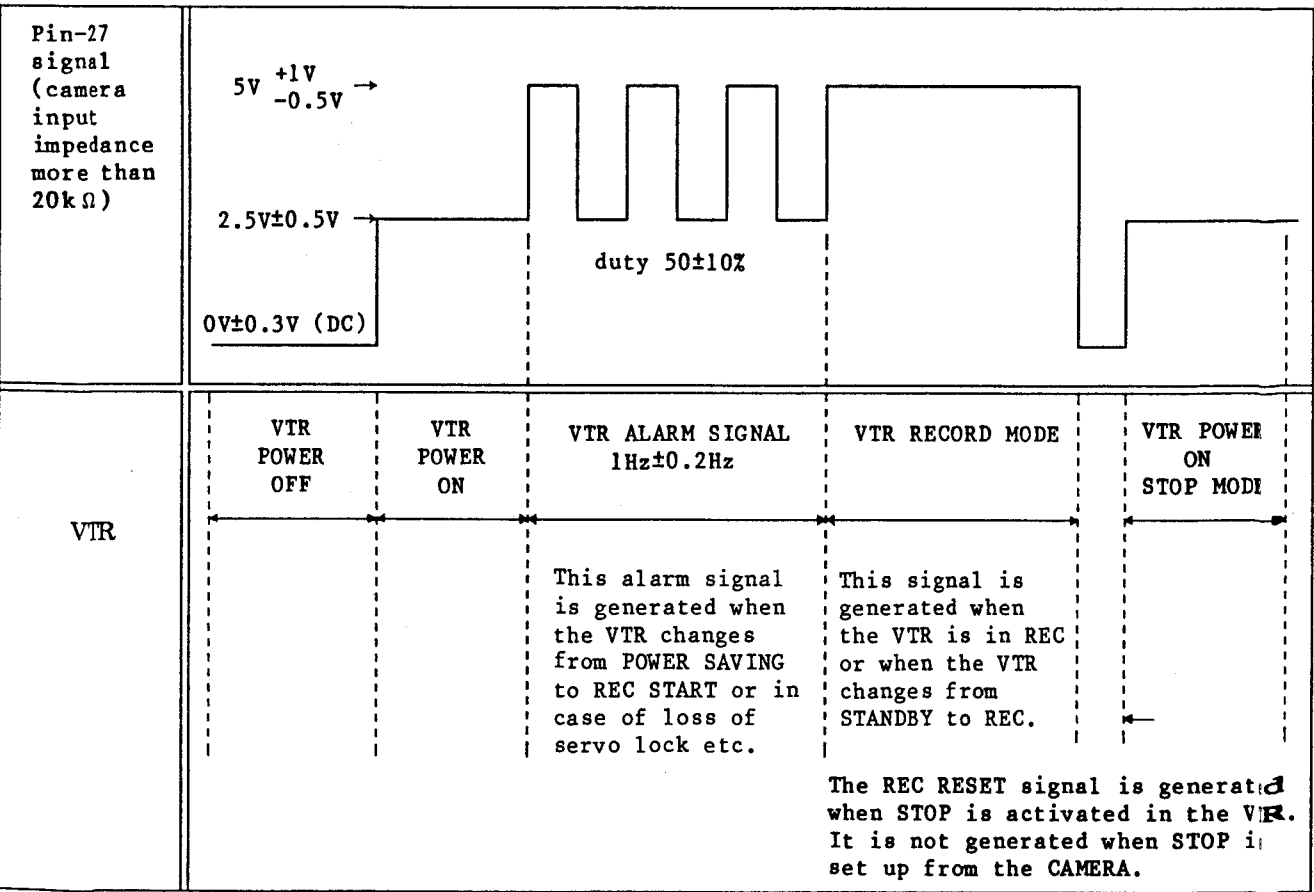
Note. 1 Signal at Pin 25

Battery voltage detection and warning signal generating circuits are located within the VTR. This signals are supplied from the VTR to the camera to either blink or light the LED in the viewfinder.

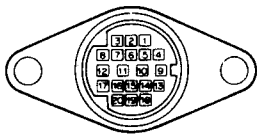
BATTERY TERMINAL ADAPTOR (VTR INTERNAL BATTERY)	DC12V to 11.1V	DC11.1V to 10.8V	PIN 25 TURNS HIGH AT DC 10.8V. 10.6V DC or below the VTR Internal Power is cut off so that the Battery Power is sent to Pin 25.
PIN 25 OUTPUT FROM VTR			
LED IN VIEWFINDER	NEITHER BLINKS NOR LIGHTS	BLINKS AT 1Hz	LIGHTS

Note. 2 Signal at Pin 27

When the VTR is ON , the input to the camera at pin 27 is 2.5V DC. In VTR record mode the voltage is 5V DC. When servo is not applied or if alarm signals are generated within the VTR, an alternating 1Hz signal (2.5Vp-p with 2.5V DC as reference) is sent to the camera. At the tape end when the VTR enters Stop mode or when setting up the Stop mode from the VTR, 0V DC is generated from 10msec to 100msec (called REC RESET). After REC RESET the signal level returns to 2.5V DC.



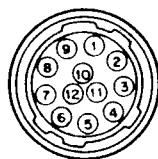
VF (20P)



(EXT VIEW)

PIN No.	SIGNAL	REMARK FOR SIGNAL
1	FILTER 1 OUT	ON: +5 V, OFF: 0 V or OPEN
2	FILTER 2 OUT	
3	FILTER 3 OUT	
4	FILTER 4 OUT	
5	GAIN UP IND. OUT	ON: +5 V, OFF: 0 V or OPEN, +9 dB: $Z_o=7\text{ k}\Omega$ +18 dB: $Z_o=1\text{ k}\Omega$
6	CCIR/EIA OUT	CCIR: +8.8 V, EIA: 0 V, $Z_o=1\text{ k}\Omega$
7	AUTO IND. OUT	ON: +5 V, OFF: 0 V or OPEN, $Z_o=470\text{ k}\Omega$
8	TAPE IND. 1 OUT	ON: +4.5 V, OFF: 0 V or OPEN, $Z_o=330\Omega$
9	TAPE IND. 2 OUT	
10	MIC IN (G)	GND for MIC
11	ZEBRA/AUDIO IN/OUT	ZEBRA ON: 0 V, OFF: +5 V or OPEN AUDIO: $Z_o\leq 30\Omega$, -15 dBs $\pm$ 1 dB
12	VF VIDEO OUT (X)	VBS 1 Vp-p, $Z_o\leq 100\Omega$
13	AUDIO CONT IN	0 V (0 dB) ~ +7 V (-20 dB)
14	MIC IN (Y)	$Z_o\leq 600\Omega$ -60 dBm balanced
15	MIC IN (X)	
16	BATT IND. OUT	ON: +4.5 V, OFF: 0 V or OPEN, $Z_o=330\Omega$
17	REC/TALLY OUT	ON: +8.8 V, OFF: 0 V or OPEN
18	+9.3 V (VF) OUT	REG+9.3 V
19	GND	GND
20	UNREG OUT	+10.6 V ~ 17 V

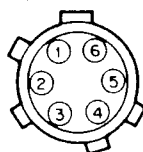
LENS (12P)



(EXT VIEW)

PIN No.	SIGNAL	REMARK FOR SIGNAL
1	RET VIDEO ENABLE IN	ENABLE: 0 V, DISABLE: +5 V or OPEN
2	VTR START/STOP IN	TRIGGER 5 Vp-p
3	GND	GND for UNREG
4	AUTO +5 V OUT	AUTO: +5 V, MANU: 0 V or OPEN
5	IRIS CONT OUT	+3.4 V (F16) ~ +6.2 V (F2.8)
6	UNREG OUT	+10.6 V ~ +17 V
7	IRIS POSITION IN	+3.4 V (F16) ~ +6.2 V (F2.8)
8	REMOTE/LOCAL OUT	0 V
9	EXTENDER ON/OFF IN	ON: 0 V, OFF: +5 V or OPEN
10	(Spare)	
11	(Spare)	
12	(Spare)	

REMOTE (6P)



(EXT VIEW)

PIN No.	SIGNAL	REMARK FOR SIGNAL
1	(Spare)	
2	SERIAL DATE IN/OUT	Serial data for camera control
3	UNREG (GND)	GND for UNREG
4	(Spare)	
5	(Spare)	
6	UNREG OUT	+10.6 V ~ +17 V

1-4-2. Connector

Connection made with the connector panels during installation or service, should be made with the connectors/complete cable assemblies specified in the following list, or equivalent parts;

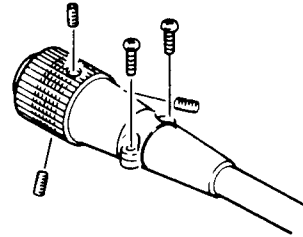
Connector function	Parts No., and name of connector with cable
TEST OUT (BNC)	1-560-069-11 PLUG, BNC or UGC-0.5 cable assembly (Cable length 1.5m, optional)
VF (20P, FEMALE)	1-943-426-12 VF cable
LENS (12P, FEMALE)	1-562-356-11 PLUG, 12P, MALE
REMOTE (6P, MALE)	1-557-406-11 REMOTE CONTROL CABLE (Cable length 10m)
50-PIN CONNECTOR (50P, MALE)	1-562-083-00 PLUG, 50P, FEMALE (Contained within CA-3A, CA-50/51/55/57 and BVV-5)

1-4-3. Removal of the CCZ, CCZQ connectors

CCZ, CCZQ Connectors (Removal of the connector)

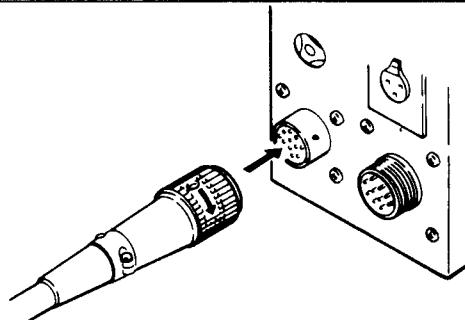
Step 1.

Remove the three hexagonal setscrews and the two setscrews.



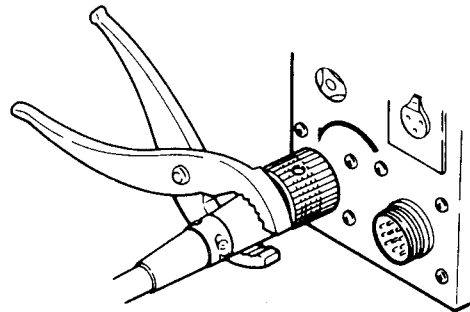
Step 2.

Fix the CCZ connector at the camera or VTR connector.



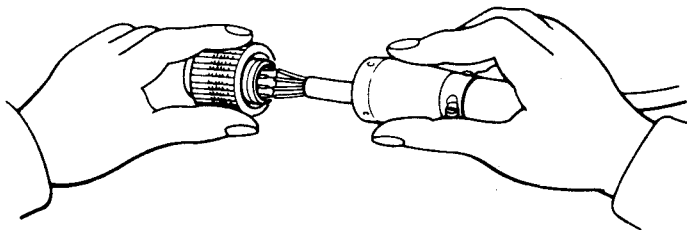
Step 3.

Rotate the CCZ connector counterclockwise by the plier and loosen it.



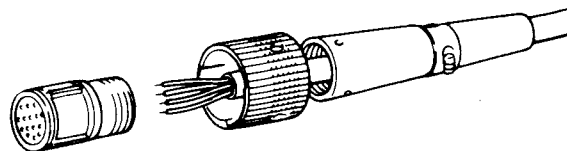
Step 4.

It can be removed by hand and unsolder.

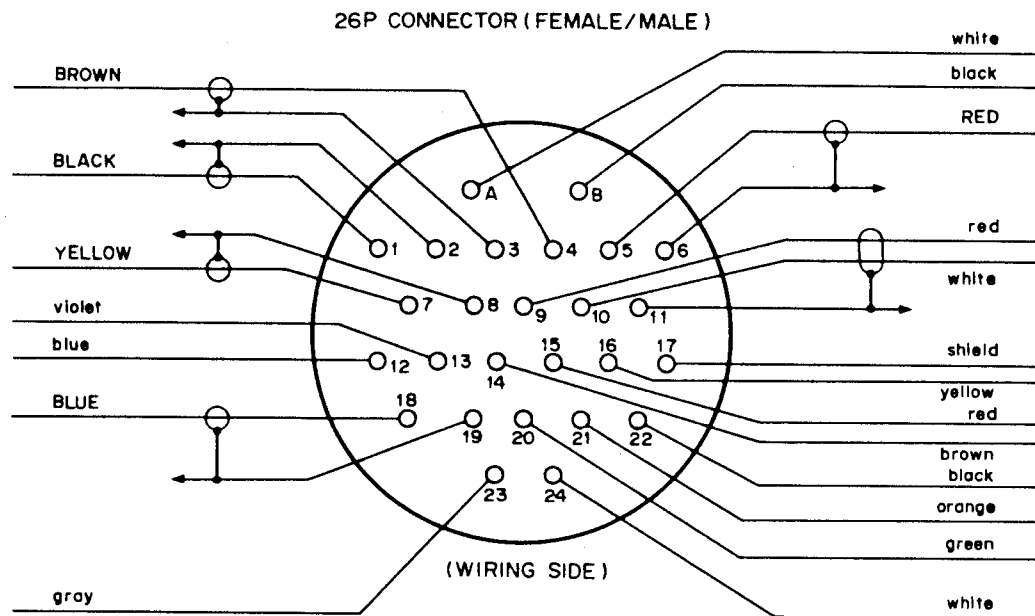


Step 5.

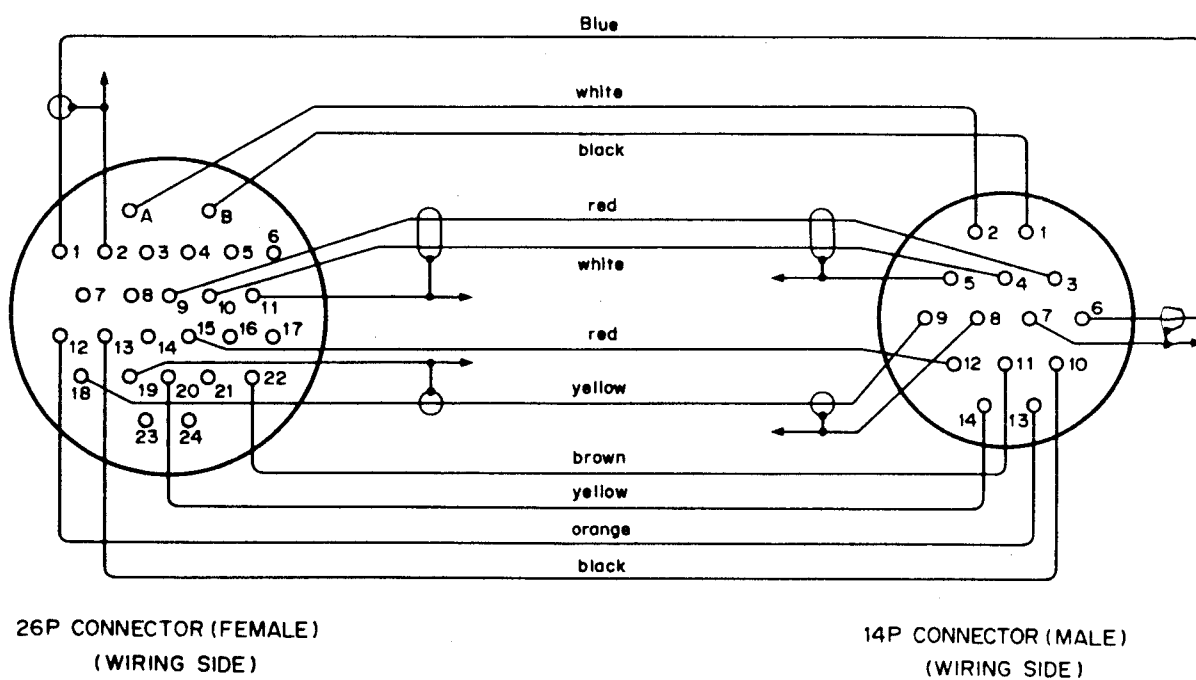
It can be broken up as shown in Figure.



CCZ cable (wiring diagram)



CCZQ cable (wiring diagram)



1-5. INSTALLATION CONDITIONS

Operating temperature -20°C to +45°C

Storage temperature -20°C to +60°C

Humidity Non condense

- . Avoid rough handling or mechanical shock to the camera.
- . Avoid placing subject to direct sunlight, excessive dust, mechanical vibration or shock.
- . Clean the viewfinder lens with a lens cleaner available at camera stores.
Do not use any type of solvent, such as alcohol, benzine or thinner.
- . After using the camera
Turn off the power of a equipment connected to the camera.

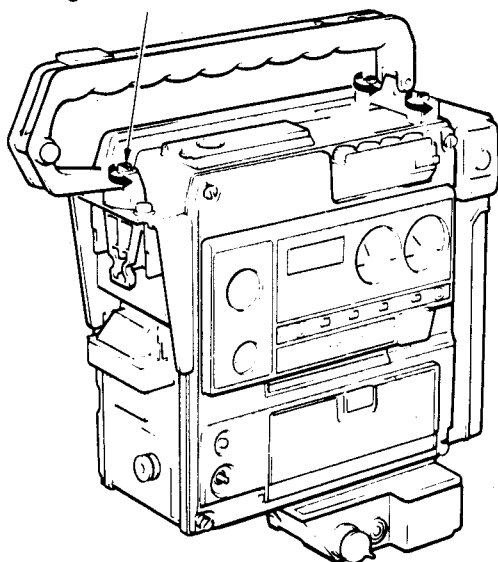
1-6. SET-UP

1-6-1. Set up with the BVV-1/1PS/1A/1APS/5/5PS VTR

(1) When the grip of BVP-7A/7AP is used;
Step 1. Remove the grip and shoulder pad
(BVV-1A/1APS only) of the VTR.

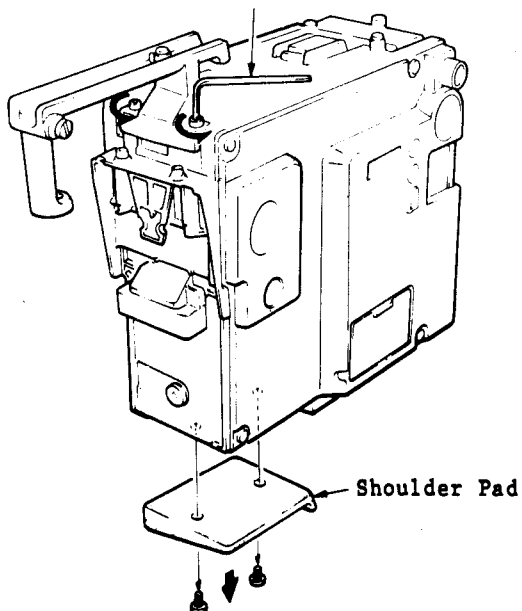
BVV-5/5PS

Using a coin or similar item



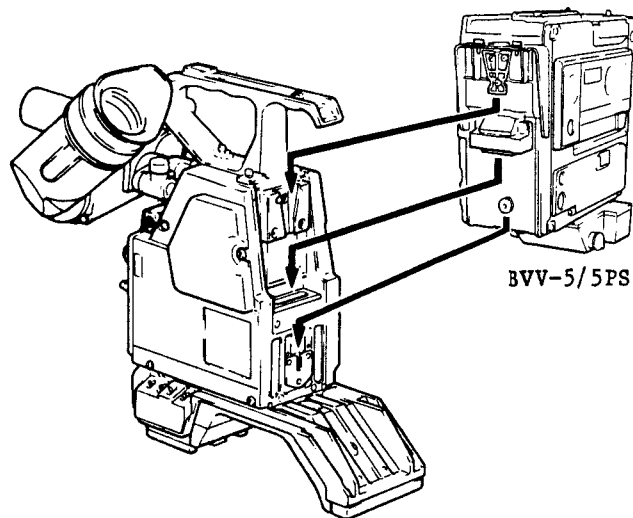
BVV-1A/1APS

L-shaped
Hexagonal
Wrench (2.5mm dia)

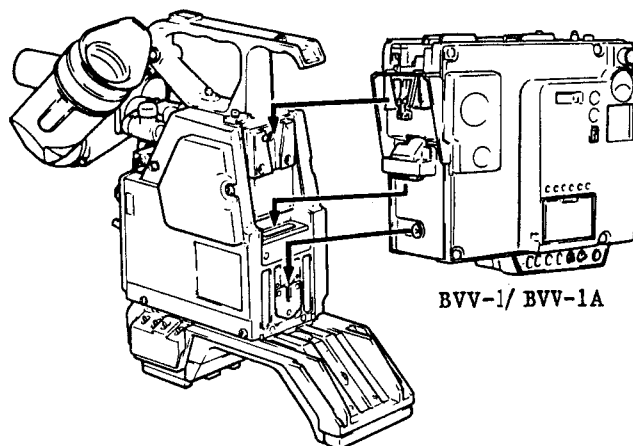


BVP-7A (UC)
BVP-7AP (EK)

Step 2. Attach the VTR to the camera.



BVV-5/5PS



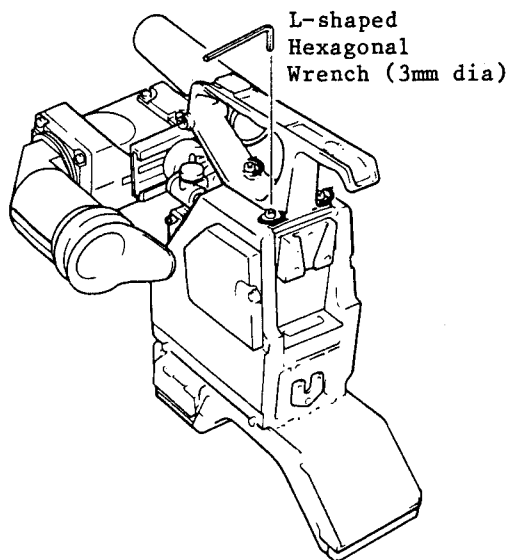
BVV-1/ BVV-1A

Step 3. Tighten the screws (supplied with the VTR) securely.

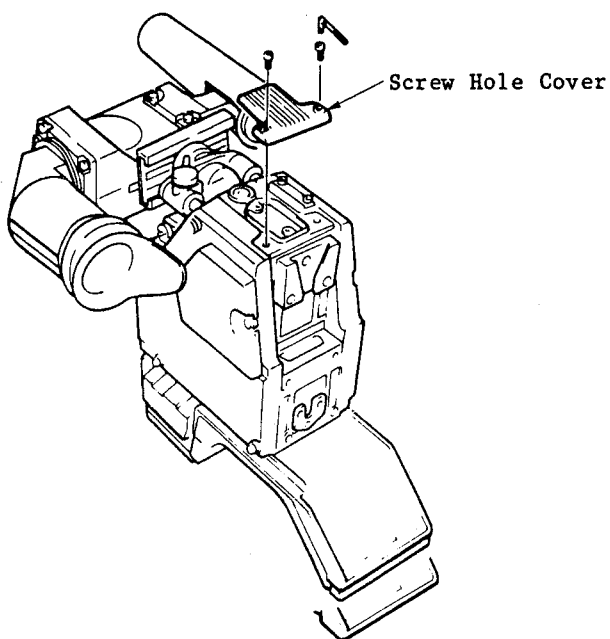
Step 4. Tighten the two screws (+B4x5) supplied with the VTR into the unoccupied screw holes for the VTR grip.

(2) When the grip of BVV-1/1PS/1A/1APS/5/5PS VTR is used;

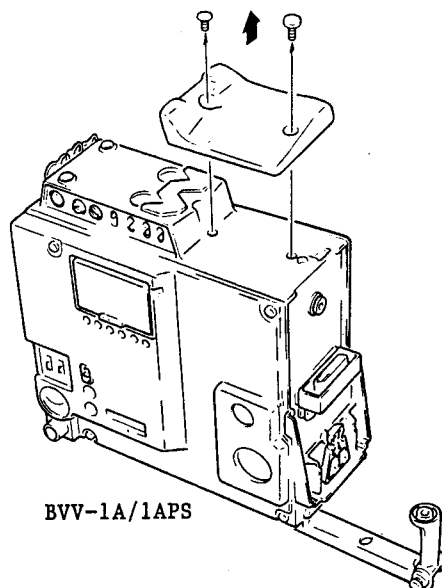
Step 1. Remove the grip of the camera with the wrench supplied with the VTR.



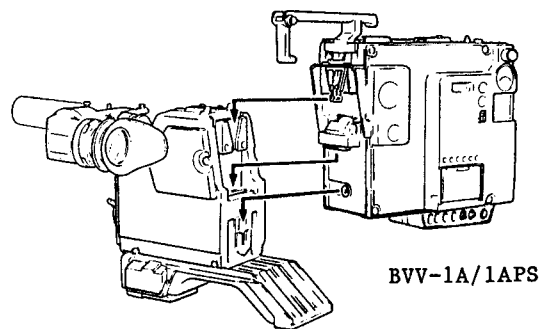
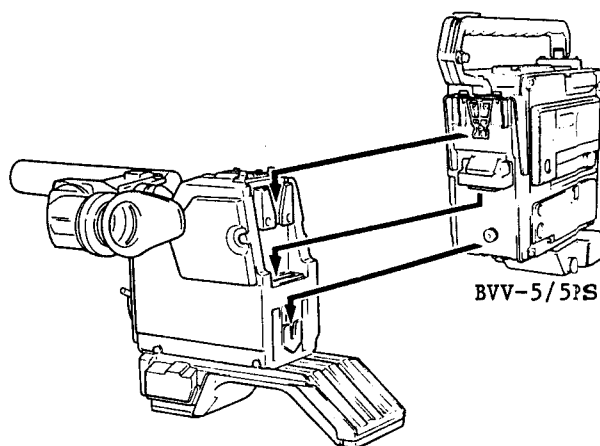
Step 2. Attach the upper lid ass'y (supplied) to the screw holes of the grip.



Step 3. Remove the shoulder pad of the VTR.



Step 4. Attach the VTR to the camera.

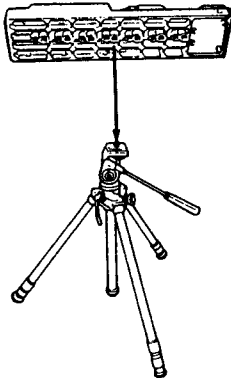


Step 5. Fasten the screws (supplied with the VTR) securely.

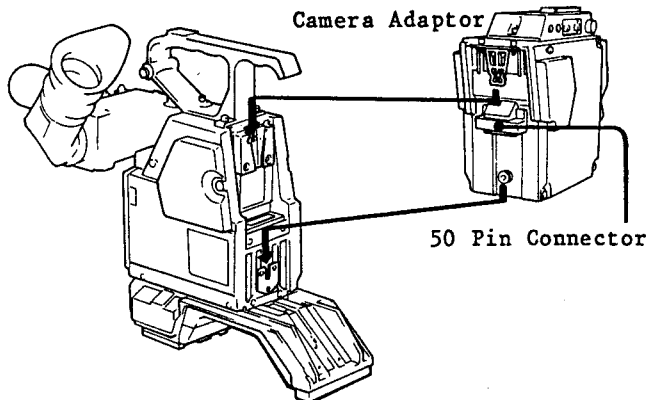
1-6-2. For System Use

Step 1. Attach the tripod attachment (VCT-14) to the tripod.

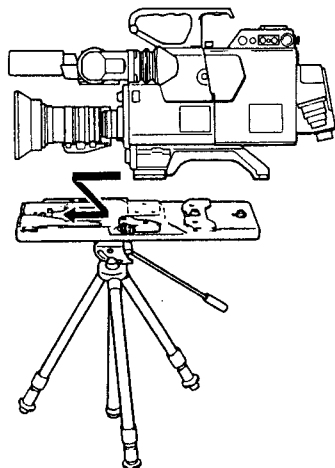
Fit the screw of the tripod into one of the screw holes on the bottom of the tripod attachment.



Step 2. Attach the camera adaptor to the camera.



Step 3. Attach the camera to the tripod attachment.
Slide the camera along the groove of the tripod attachment until it clicks.



Step 4. Attach the viewfinder (BVF-50/50CE or BVF-55/55CE) to the shoe on the camera adaptor.

Refer to operation and maintenance manual of the viewfinder for details on installation.

1-7. GAIN CHANGES

The gains of 0-9-18dB can be selected with the GAIN selector (side panel) at the factory, but it can be changed to 24dB from 18dB.

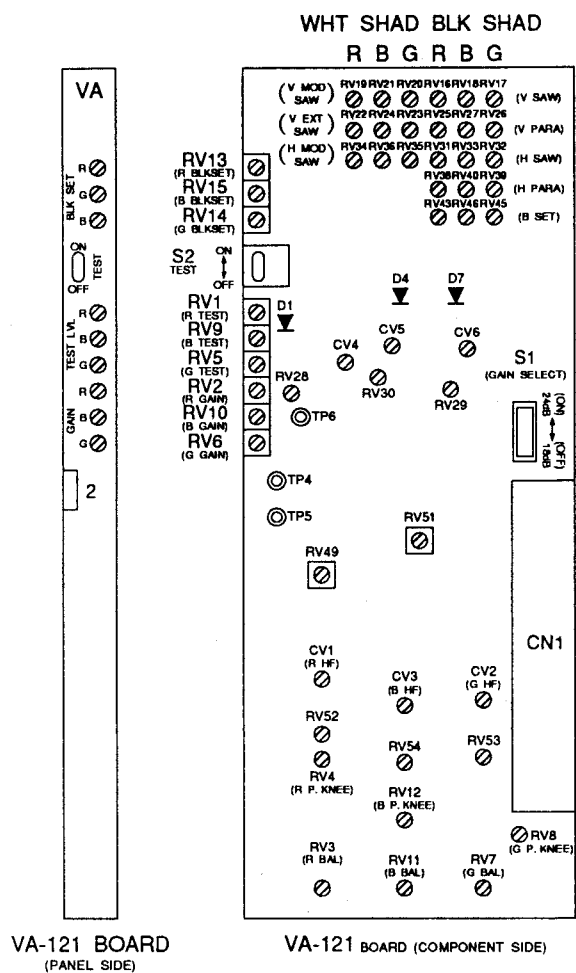
Therefore the gain can be set as follows.

0 - 9 - 18dB

0 - 9 - 24dB

Changing from 18dB to 24dB

By setting the S1 (GAIN SELECT) switch on the VA-121 board to "24dB", the video output level can be raised by 24dB at the 18-position of GAIN selector (side panel). When the S1 switch is changed; 18dB $\rightarrow$ 24dB or 24dB $\rightarrow$ 18dB, be sure to perform the +18dB Black Set adjustment.



1-8. SWITCH, CONTROL SETTING

1-8-1. Maintenance

Note: The camera needs the following adjustments for maintenance because the change is caused in temperature or in any other conditions. When replacing the CCD unit or in overhauling, be sure to adjust the camera according to "SECTION 4 ALIGNMENT".

VA-121

BLK SET (R, G, B) (RV13, 14, 15)
Adjust so that no pedestal level changes when the GAIN switch is set at +9dB or +18dB.

TEST ON/OFF (S2)
Used for checking the video level. When turned on, the lens is automatically closed and the TEST SAW waveform is added to the video signal system. Normally set to "OFF".

TEST LVL R, G, B (RV1, 5, 9)
Used for checking the video level. Adjust the level of TEST SAW waveform signal at 100IRE (700mV).

GAIN R, G, B (RV2, 6, 10)
Adjust so that the video level of output at VA-121 board is 0.5Vp-p.

IE-25A/25AP

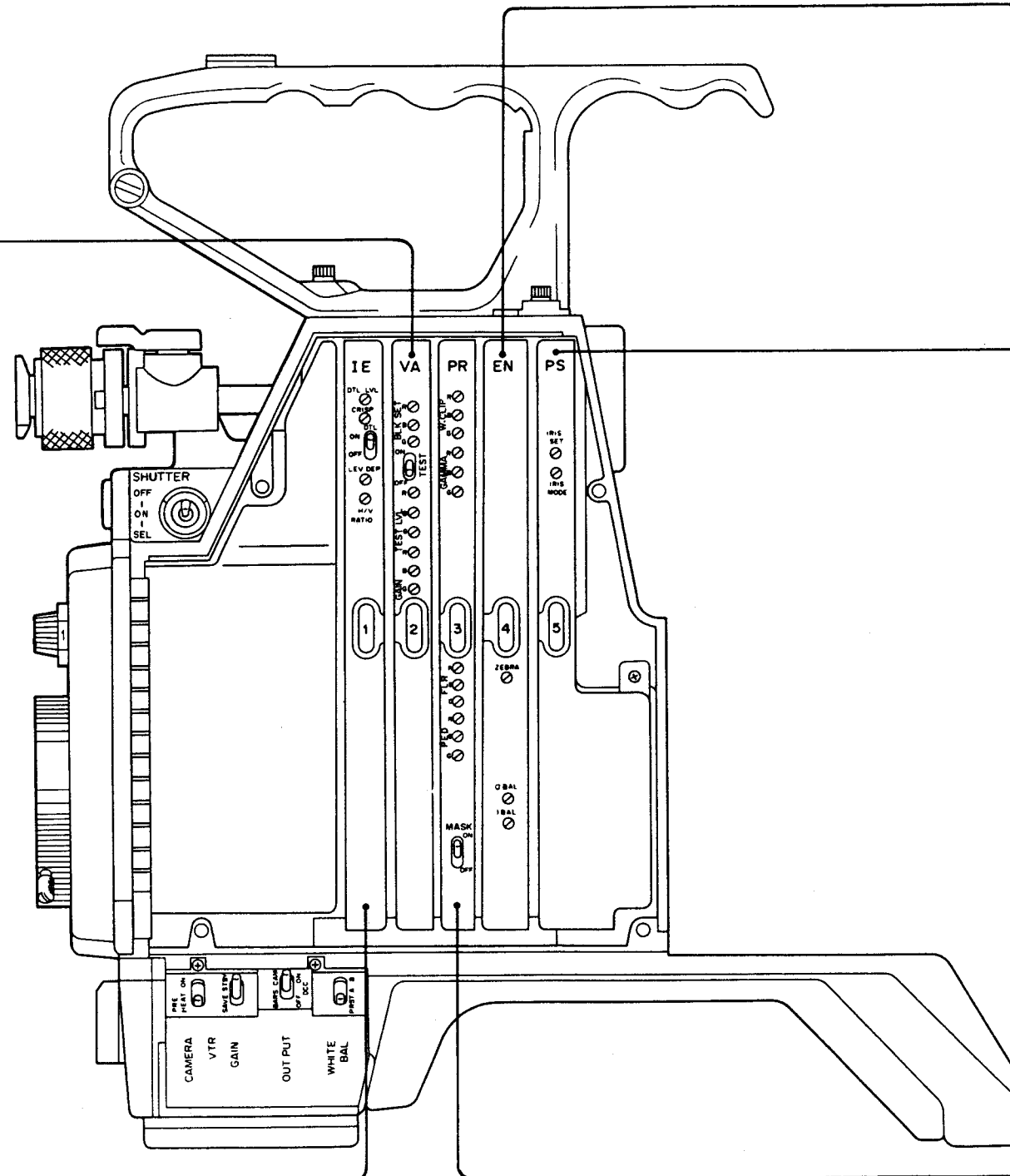
DTL ON/OFF (S1)
Turns on or off the detail signal.

DTL (RV5)
Adjust the detail amount.

H/V RATIO (RV7)
Adjust the balance of the horizontal and vertical of the detail signals.

LEVEL DEPEND (RV8)
Adjust RV8 so that the detail signal is not superimposed near the black level of a signal.

CRISPENING (RV4)
Adjust RV4 so that the small amplitude noise is eliminated from the detail signal.



EN-69/69P

ZEBRA (RV13)
Adjust RV13 to display the zebra pattern at 70IRE video level portion on the viewfinder.

Q/U BAL (RV21)
I/V BAL (RV19)
Adjust RV21 and RV19 alternately for the optimum black balance of encorder (minimum carrier leakage), observing the vectorscope.

PS-173

IRIS MODE (RV4)
Adjust RV4 to select the peak level detection or the average level detection for the detection mode of auto iris.

IRIS SET (RV5)
When the AUTO/MANUAL switch on the lens is set to AUTO mode, adjust RV5 to make the white level of video signal 100IRE.

PR-138D/138E

GAMMA R, G, B (RV3, 8, 12)
Adjust the cross point of the waveform at 60IRE (420mV), when a 11-step grayscale chart is shot so that the white level is 100IRE (700mV).

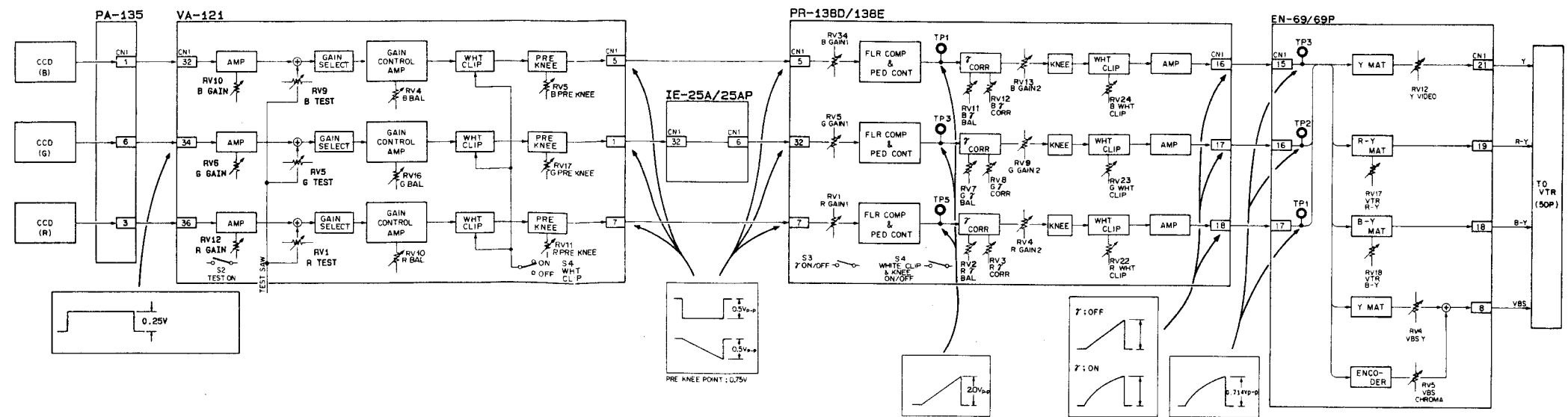
W. CLIP R, G, B (RV22, 23, 24)
Adjust the white level, when setting the GAIN switch at +9dB or +18dB.

PED R, G, B (RV2, 33, 10)
Adjust the pedestal level at 3IRE at closing the lens iris.

FLR R, G, B (RV25, 26, 27)
Compensate the dispersion of the video level due to the flare.

MASK ON/OFF (S1)
Turns on or off the masking signal. Normally set to OFF. (PAL: ON)

1. Adjust the iris control so that the video level at CN1-34 [VA-121 board] is $0.25 \pm 0.03\text{Vp-p}$.
2. Adjust the $\odot$ RV6 (G GAIN) [VA-121 board] so that the video level at CN1-32 [PR-138D/138E board] is $0.5 \pm 0.01\text{Vp-p}$.
3. Adjust the $\odot$ RV2 (R GAIN) [VA-121 board] so that the video level at CN1-7 [PR-138D/138E board] is $0.5 \pm 0.01\text{Vp-p}$.
4. Adjust the $\odot$ RV10 (B GAIN) [VA-121 board] so that the video level at CN1-5 [PR-138D/138E board] is $0.5 \pm 0.01\text{Vp-p}$.
5. Set the S2 (TEST ON/OFF) [VA-121 board] to "ON".
6. Adjust the $\odot$ RV5 (G TEST) [VA-121 board] so that the video level at CN1-32 [PR-138D/138E board] is $0.5 \pm 0.01\text{Vp-p}$.
7. Adjust the $\odot$ RV1 (R TEST) [VA-121 board] so that the video level at CN1-7 [PR-138D/138E board] is $0.5 \pm 0.01\text{Vp-p}$.
8. Adjust the $\odot$ RV9 (B TEST) [VA-121 board] so that the video level at CN1-5 [PR-138D/138E board] is $0.5 \pm 0.01\text{Vp-p}$.
9. Adjust the $\odot$ RV7 (G γ BIAS) [PR-138D/138E board] for such a position that the white peak level at CN1-17 [PR-138D/138E board] does not change while setting S3 (γ ON/OFF) [PR-138D/138E board] at ON or OFF.
10. Adjust the $\odot$ RV2 (R γ BIAS) [PR-138D/138E board] for such a position that the white peak level at CN1-18 [PR-138D/138E board] does not change while setting S3 (γ ON/OFF) [PR-138D/138E board] at ON or OFF.
11. Adjust the $\odot$ RV11 (B γ BIAS) [PR-138D/138E board] for such a position that the white peak level at CN1-16 [PR-138D/138E board] does not change while setting S3 (γ ON/OFF) [PR-138D/138E board] at ON or OFF.
12. Adjust the $\odot$ RV9 (G GAIN) [PR-138D/138E board] so that the video level at TP2 [EN-69/69P board] is $0.7 \pm 0.01\text{Vp-p}$.
13. Adjust the $\odot$ RV4 (R GAIN) [PR-138D/138E board] so that the video level at TP1 [EN-69/69P board] is $0.7 \pm 0.01\text{Vp-p}$.
14. Adjust the $\odot$ RV13 (B GAIN) [PR-138D/138E board] so that the video level at TP3 [EN-69/69P board] is $0.7 \pm 0.01\text{Vp-p}$.



1-8-2. Switches Setting on the Board

[VA-121 board]

. S1 (GAIN SELECT)

By setting the GAIN selector (side panel) to "18", the video output level can be raised by 18dB or 24dB with this switch.

In this case, be sure to perform the +18dB Black Set Adjustment for R, G and B video signals respectively.

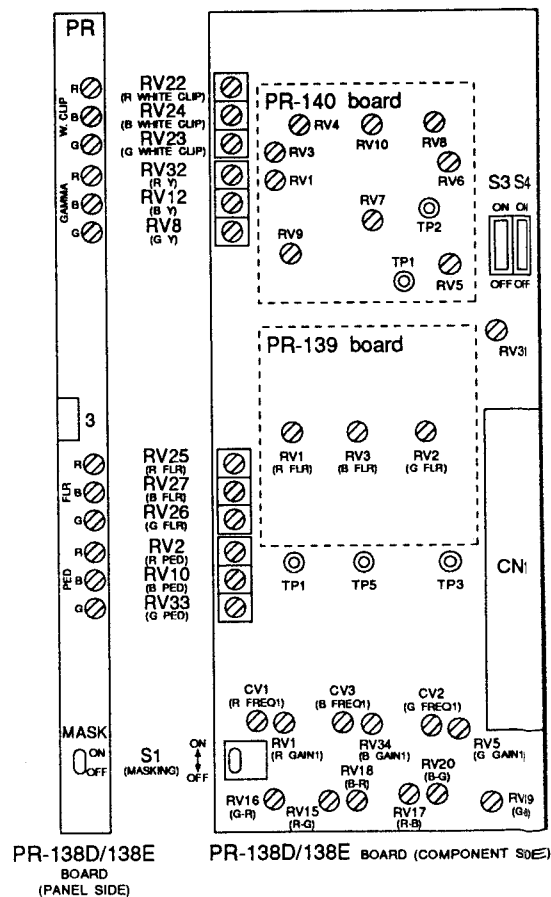
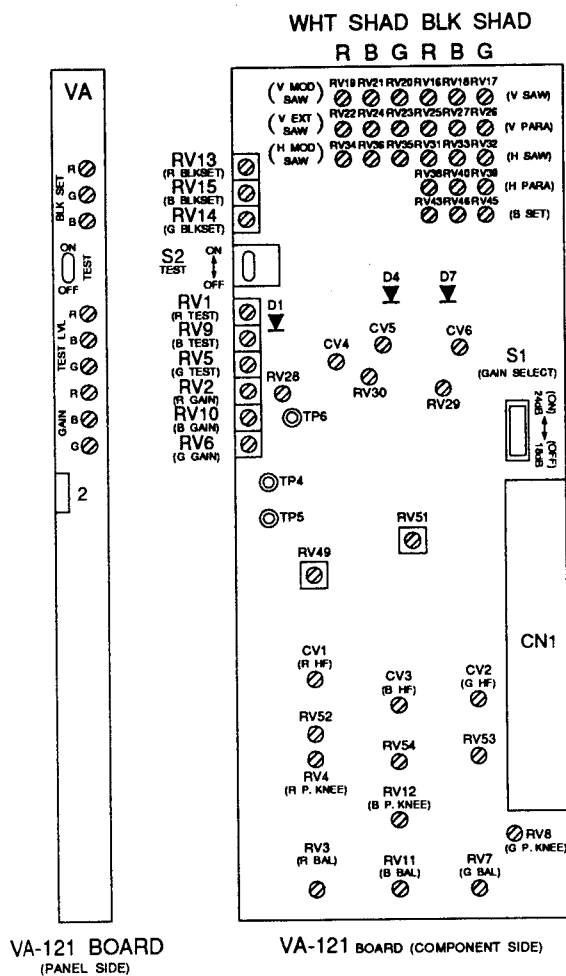
[PR-138D/138E board]

. S3 (γ ON/OFF)

When turned on, the gamma correction is performed so that the overall characteristic of signals between camera and monitor is " $\gamma = 1$ ". Normally set to "ON".

. S4 (WHITE CLIP & KNEE)

When turned off, the white clipping and knee correction are automatically released. Use for the video signal system adjustment. Normally set to "ON".



[EN-69/69P board]

. S1 (I/V) S2 (Q/U)

When turned on, the I and Q signals (or U and V signals) are added to the encoder circuit. Use for the encoder circuit adjustment. Normally set to "ON".

. S3 (ZEBRA EXT VF)

When viewfinder BVF-50/50CE or BVF-55/55CE is used, 70% level portion is displayed in the zebra pattern on the viewfinder screen with this switch set to "ON". Normally set to "OFF".

[PS-224 board]

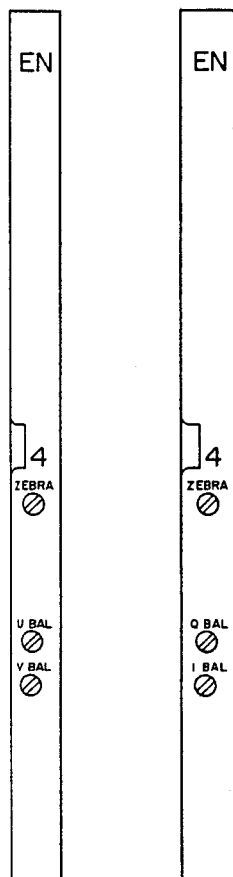
. S1 (FIELD/FRAME)

Selects the ways of CCD picture readout; "FIELD" or "FRAME". It has been set to "FIELD" at the factory.

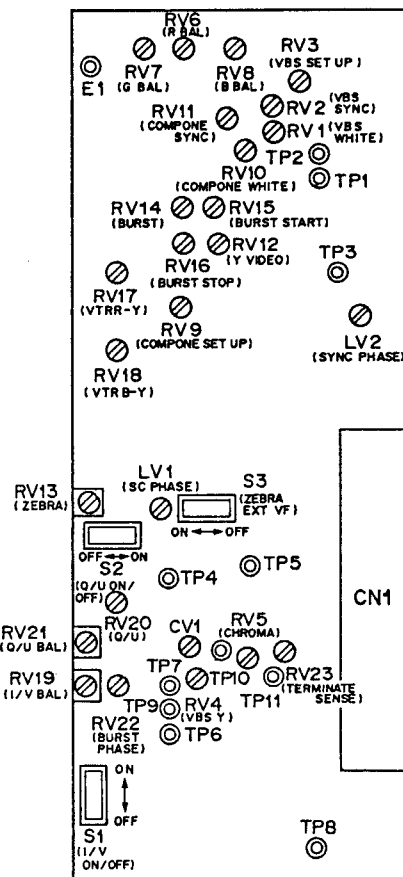
. S2 (SPC/GENERAL)

Selects the modes of the REC lamp in the Viewfinder and TALLY lamp.

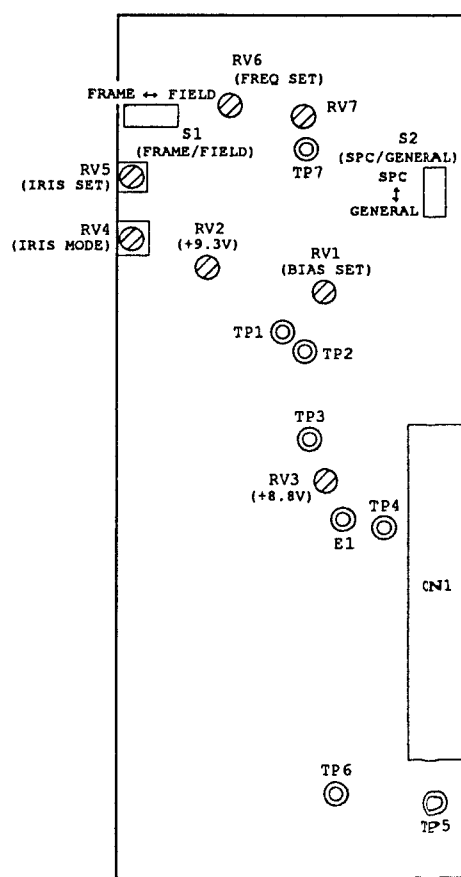
They operate ordinarily with the S2 switch set to "GENERAL". When set to "SPC", they operate as the W/B lamp besides their ordinary functions.



EN-69P BOARD (PANEL SIDE) EN-69 BOARD (PANEL SIDE)



EN-69/69P BOARD (COMPONENT SIDE)



PS-224 BOARD (COMPONENT SIDE)

[SG-143/143AP board]

. S1 (H BLKG SELECT)

Adjusts the horizontal blanking width. It has been adjusted so as to be $10.9 \pm 2\mu\text{S}$.

. S2 (V BLKG SELECT)...NTSC only

Adjusts the vertical blanking width. It has been set to "20H".

. S4 (COLOR FRAME)

When turned on, the color framing pulse is fed from pin 37 of 50-pin connectors.

. S5 (CABLE COMP)

In the external synchronous mode, turns off the GENLOCK signal from a connection cable under 150m and turns on the signal for one exceeding 150m.

. S6 (EXT SC PHASE $0^\circ/180^\circ$)

. RV4 (EXT SC PHASE)

Adjusts the SC (subcarrier) phase of the output signal in the external synchronous mode.

. S7 (INT SC PHASE $0^\circ/180^\circ$)

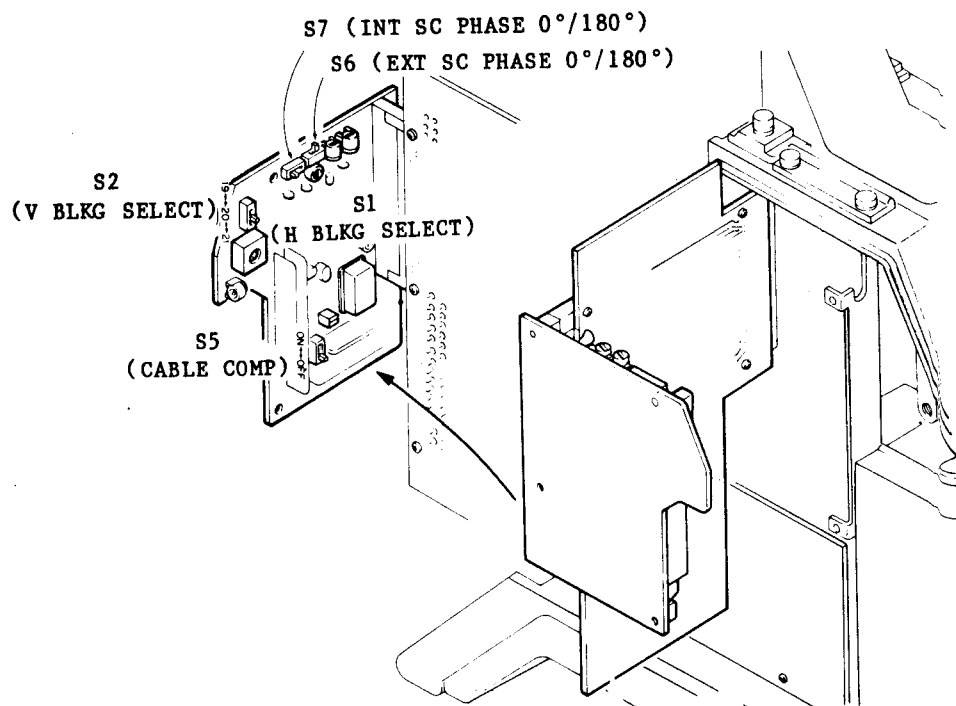
. RV5 (INT SC PHASE)

Adjusts the SC (subscatter) phase of the output signal in the internal synchronous mode.

(Be sure not to turn RV5 except when adjustment is out of condition.)

. RV3 (H PHASE)

Adjusts the phase of the camera video signal in the external synchronous mode.



[AT-58]

. S1 (CHECK, FP INH)

CHECK

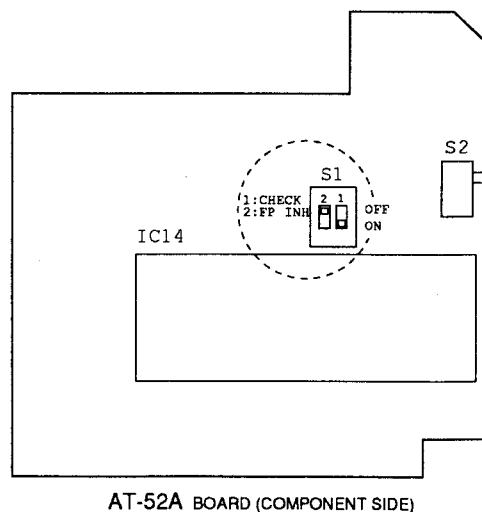
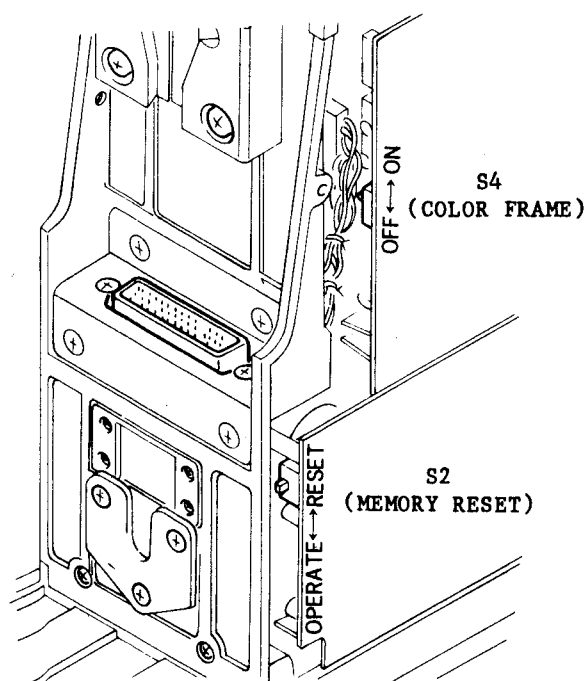
This switch is not used. Normally set to "ON".

FP INH

When set to "OFF (OPEN)", the values of the white balance adjusted at each filter position can be stored in the memory A and B independently. In short, up to 8 adjusted values; 4 for the memory A and 4 for the memory B can be stored. When set to "ON", only 2 adjusted values; one for A and one for B can be stored. In this case, the adjusted values will not correspond to the selection of the color temperature conversion filter. According to the selection of WHITE BAL switch (side panel), the white balance value is stored in the memory A and B or read out.

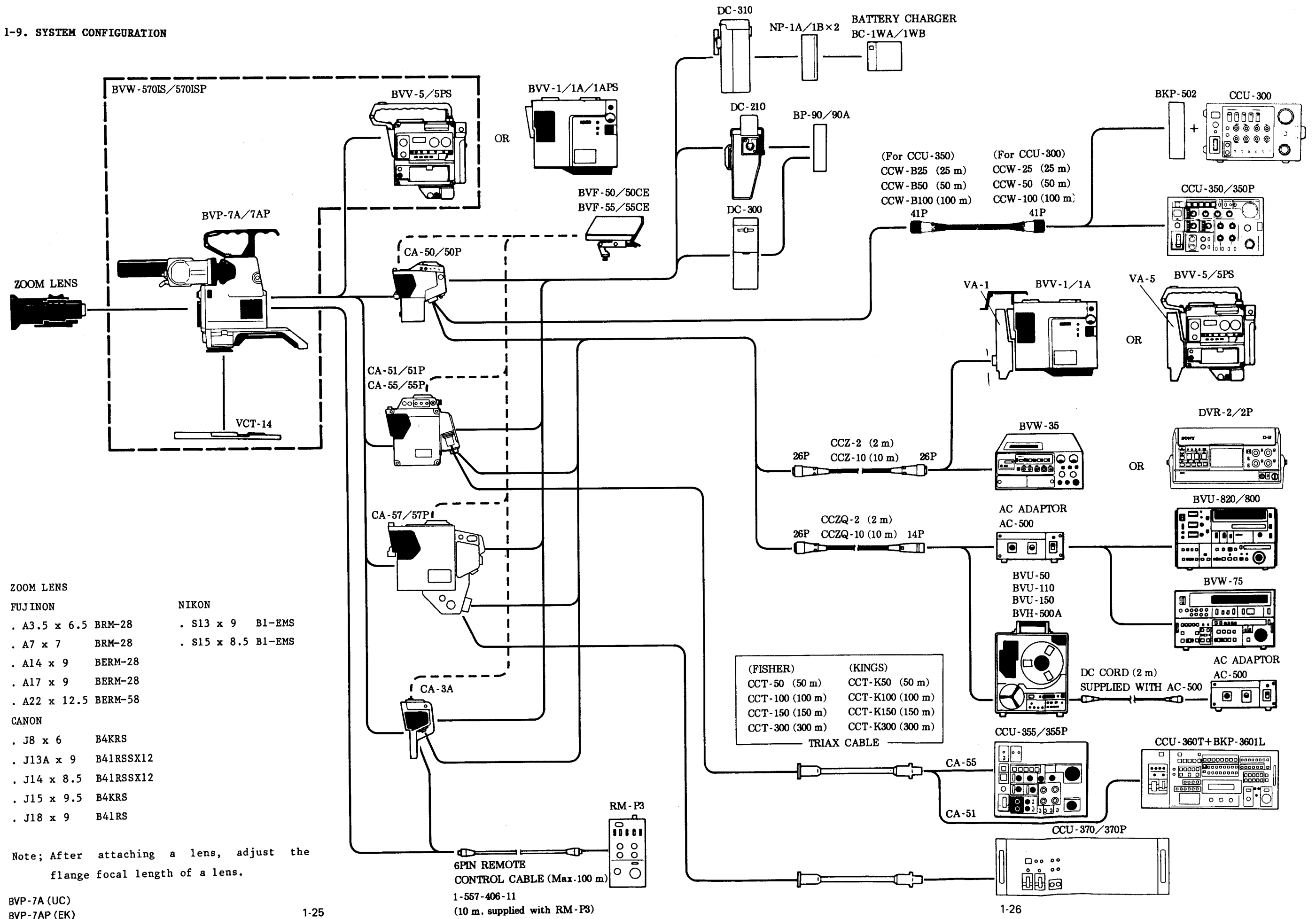
. S2 (MEMORY RESET)

By setting the CAMERA/VTR switch (side panel) to "PREHEAT/SAVE" and this switch to "RESET", the compensation data stored in the micro computer can be reset. Normally set to "OPERATE".



AT-52A BOARD (COMPONENT SIDE)

1-9. SYSTEM CONFIGURATION

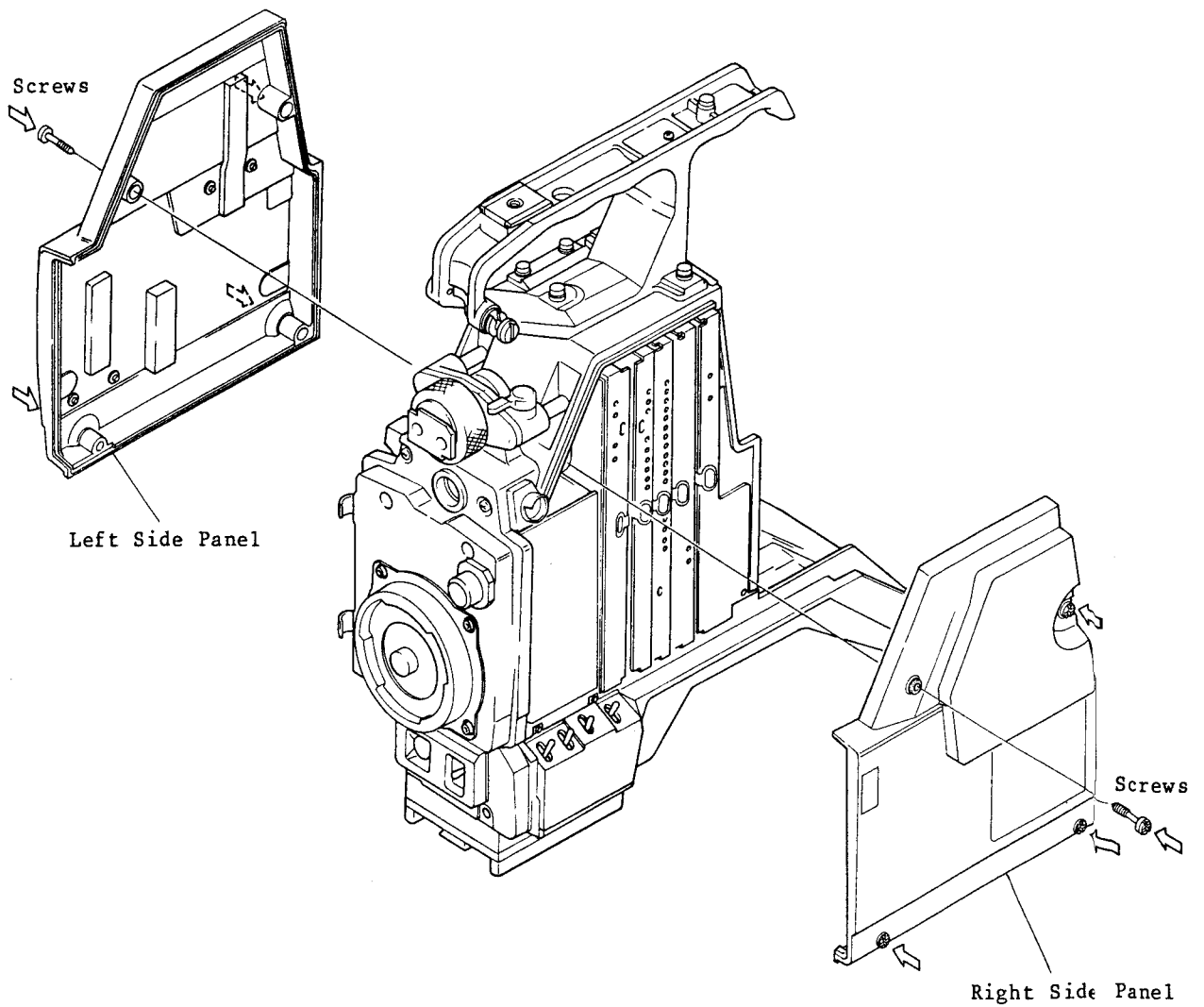


SECTION 2

REPLACEMENT OF MAIN PARTS

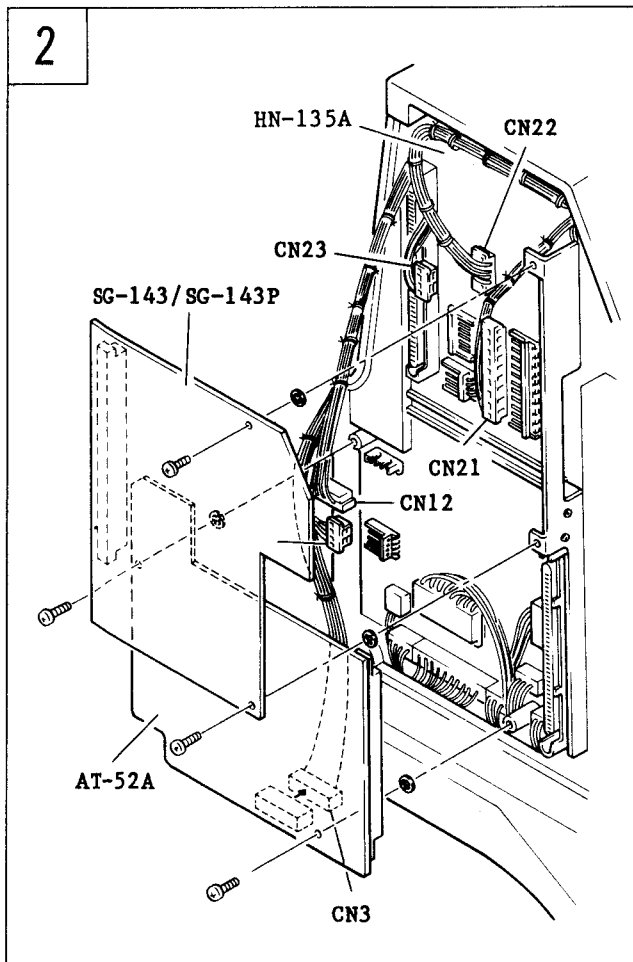
2-1. CABINET REMOVAL

To remove the left or right side panel, unscrew the four screws (M4x18) respectively.

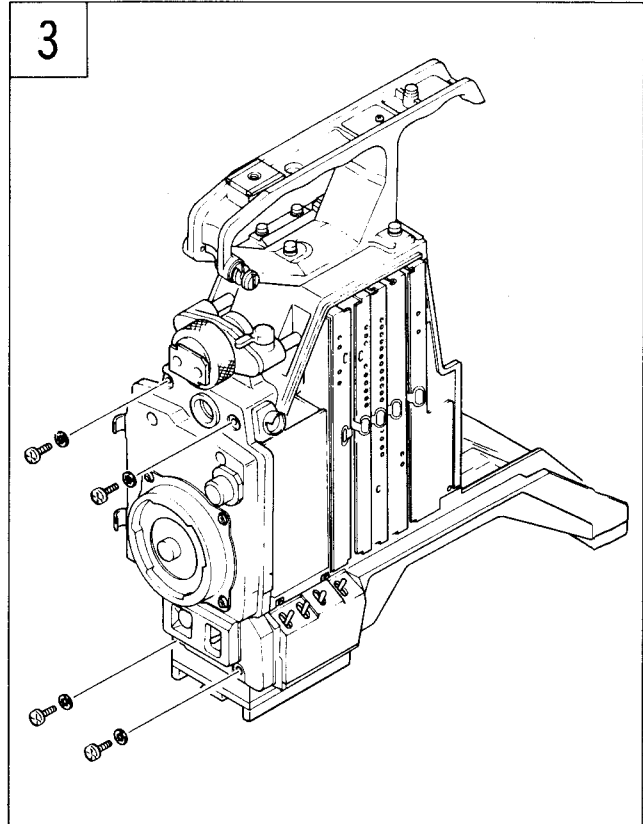


2-2. REPLACEMENT OF CCD UNIT

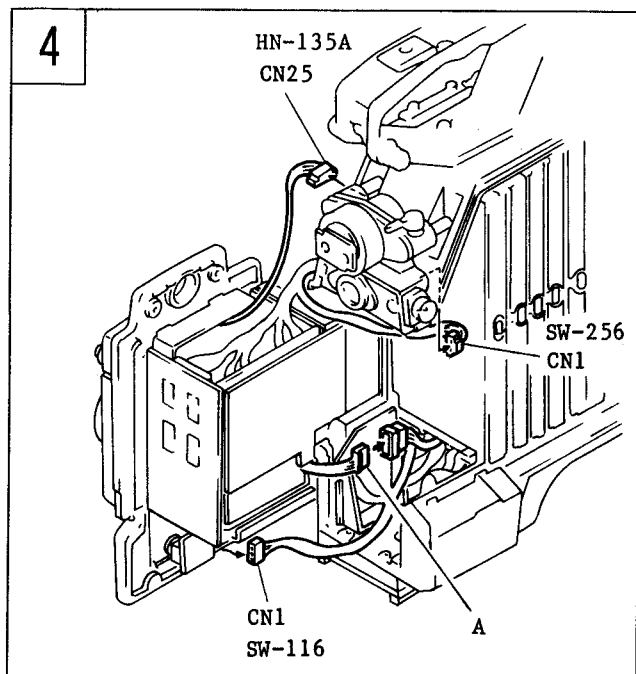
1. Remove the left and right side panels referring to Section 2-1 "CABINET OF REMOVAL".
2. Remove four screws and remove the AT-52A and SG-143/143P boards. Disconnect the connectors CN21, CN22, CN23 and CN11, CN12 on the HN-101 board and CN3 on the AT-52A board.



3. Remove four screws and remove the front panel.



4. Disconnect the three connectors, CN25 on the HN-135A board, CN1 on the SW-116 board and CN1 on the SW-256 board. Disconnect the connector A shown in the figure.

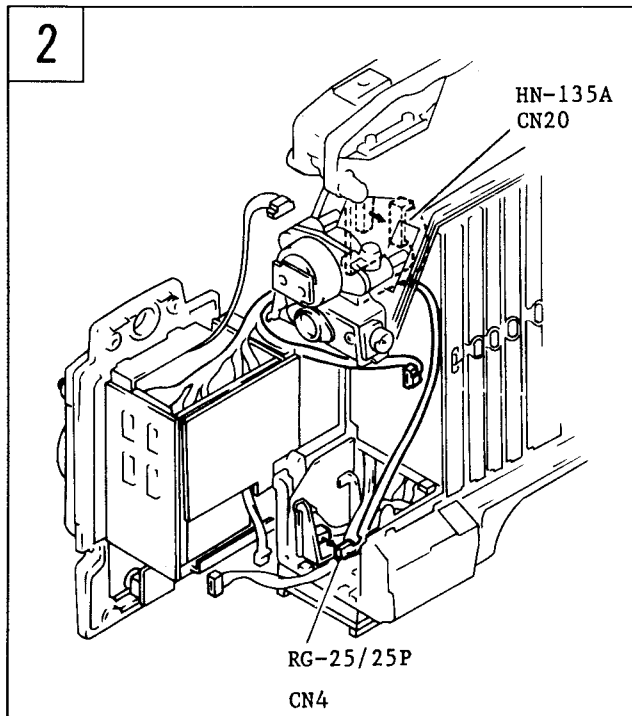


5. When a new CCD unit is installed, reverse the procedures for removal.

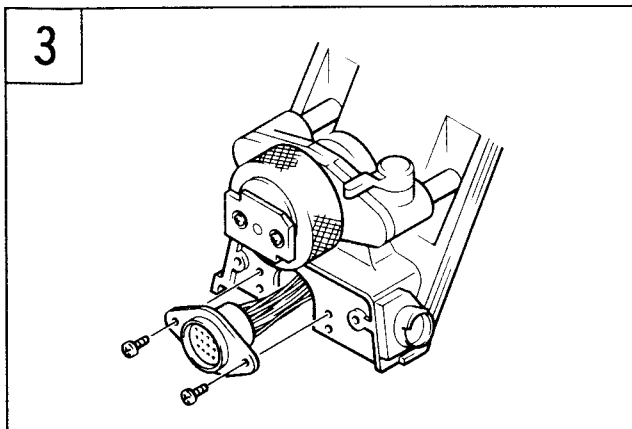
2-3. REPLACEMENT OF CONNECTORS

2-3-1. Replacement of VF Connector

1. Carry out Steps 1 to 4 in Section 2-2 "REPLACEMENT OF CCD UNIT".
2. Disconnect the two connectors, CN20 on the HN-135A board and CN4 on the RG-25/25P board.



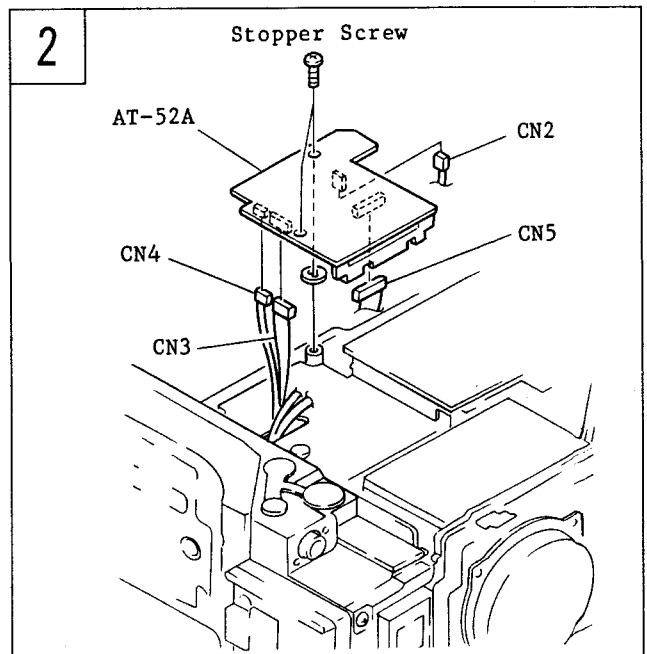
3. Remove the two screws securing the VF connector to the camera and pull out the VF connector with harness connected.



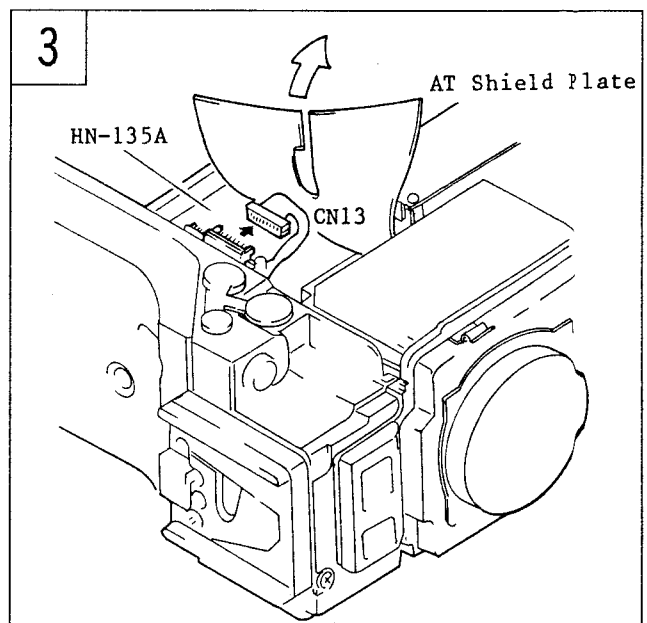
4. When installing a new VF connector, reverse the procedures for removal.

2-3-2. Replacement of LENS Connector

1. Remove the left side panel, referring to Section 2-1 "CABINET REMOVAL".
2. Remove the two stopper screws and remove the AT-52A board. Disconnect the four connectors, CN2, CN3, CN4 and CN5 on the AT-52A board.

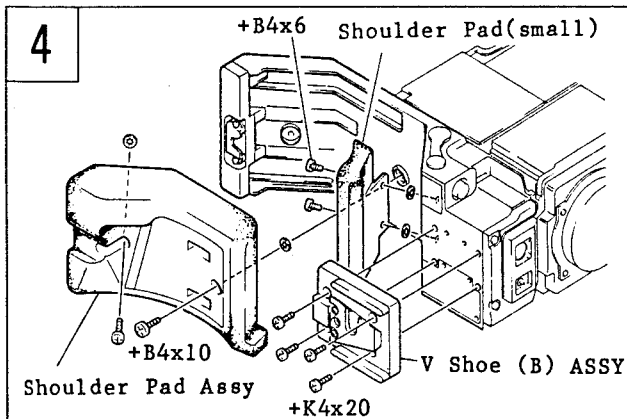


3. Lift up the AT SHIELD PLATE and disconnect the connector CN13 on the HN-135A board.

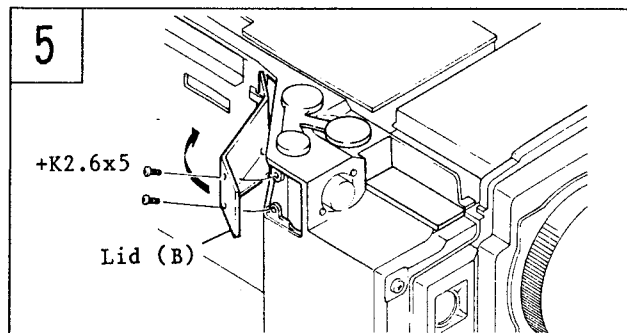


BVP-7A(UC)
BVP-7Ap(EK)

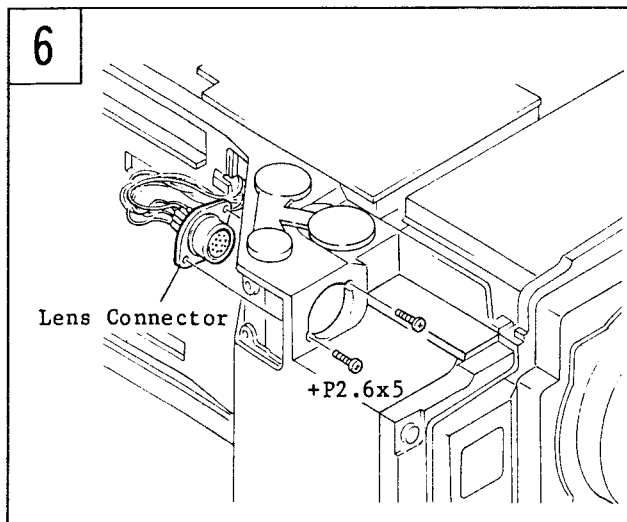
4. Lay the BVP-7A/7AP as illustrated. Remove the two screws (+B4x6) securing the SMALL SHOULDER PAD and remove the two screws (+B4x10) securing the SHOULDER PAD ASSY. Remove the four screws (+K4x20) securing the V SHOE(B) ASSY.



5. Remove the two screws (+K2.6x5) and remove the lid (B).

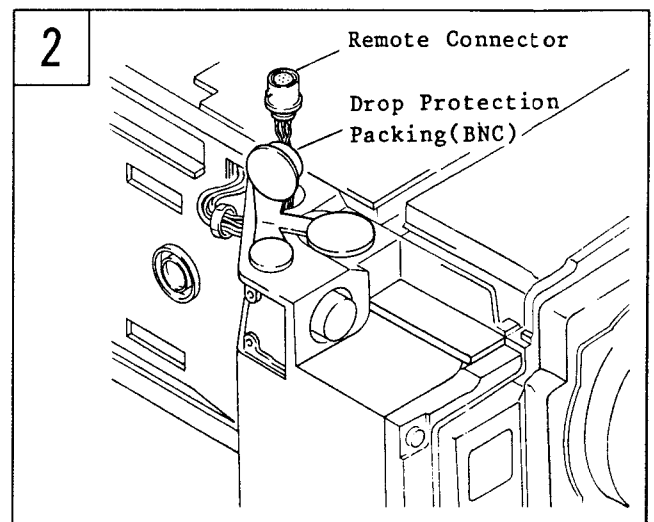


6. Remove the two screws (+P2.6x5) and remove the LENS connector with harness connected.

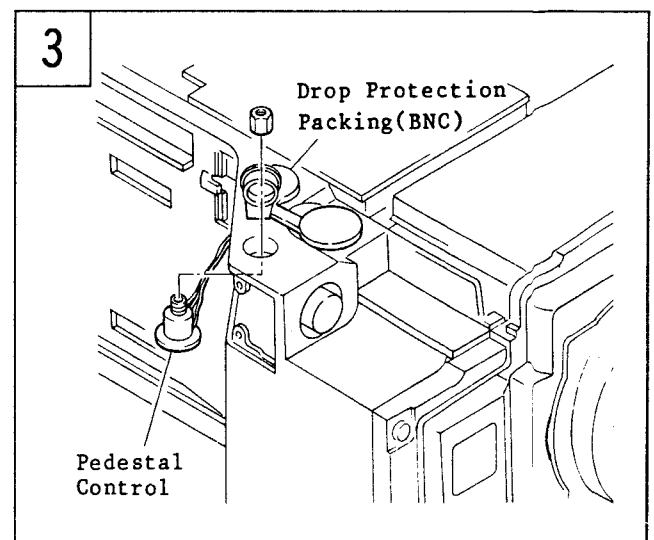


2-3-3. Replacements of REMOTE Connector and PEDESTAL Control

1. Carry out Steps 1 to 5 in Section 2-3-2 "Replacement of LENS Connector".
2. Uncover the drop protection packing(BNC) and remove the REMOTE connector as illustrated.



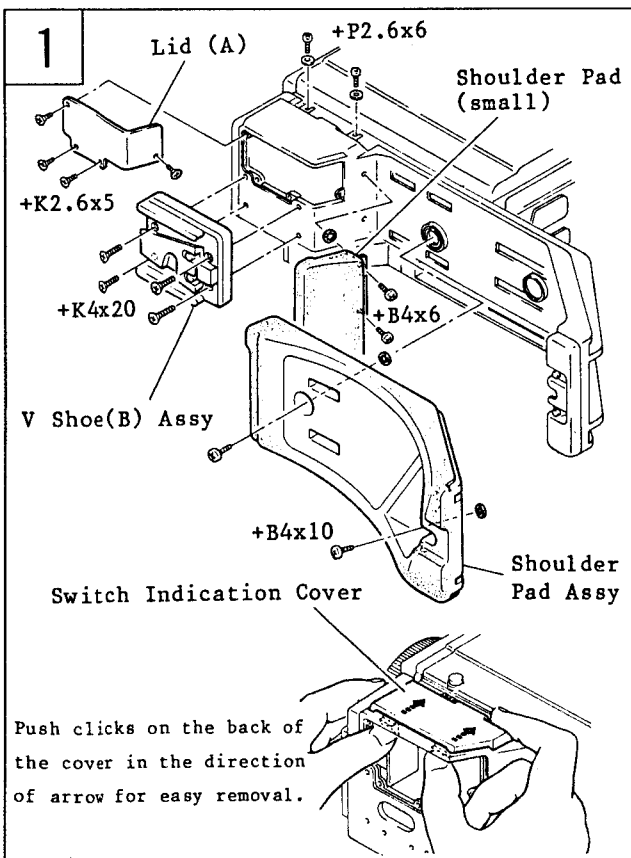
3. Uncover the drop protection packing and remove the PEDESTAL control and nut as illustrated.



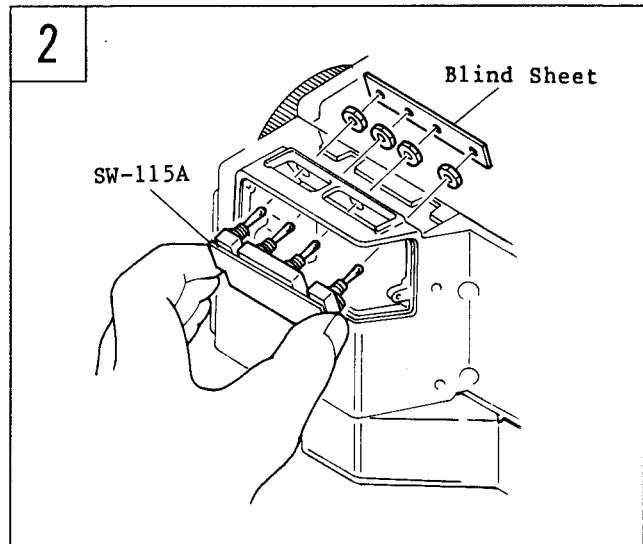
2-4. REPLACEMENT OF FUNCTION SWITCHES

2-4-1. Replacement of Switches on SW-115A Board

1. Lay the BVP-7A/7AP as illustrated. Remove the SHOULDER PAD ASSY, SMALL SHOULDER PAD and V SHOE(B) ASSY. Remove the two screws (+K2.6x5) and remove the lid (A). Remove the two screws (+P2.6x6) and remove the switch indication cover.



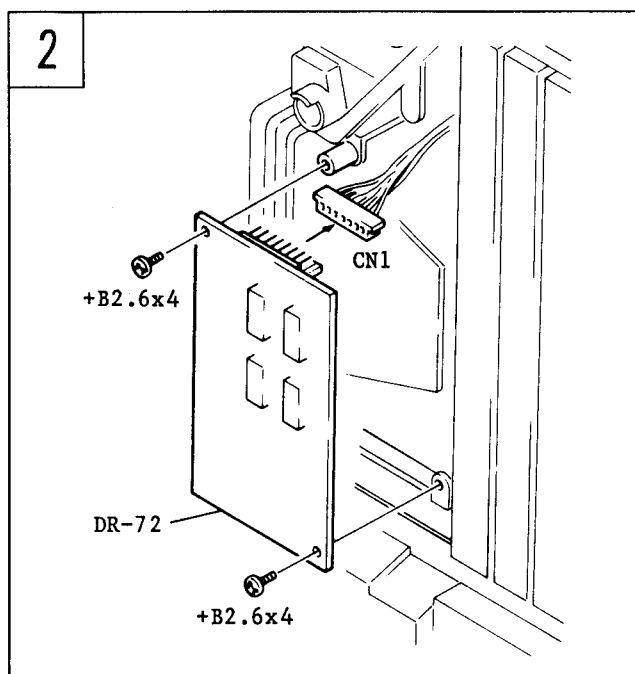
2. Remove the blind sheet and remove the four nuts securing the switches. Pull out the SW-115A board with the switches mounted.



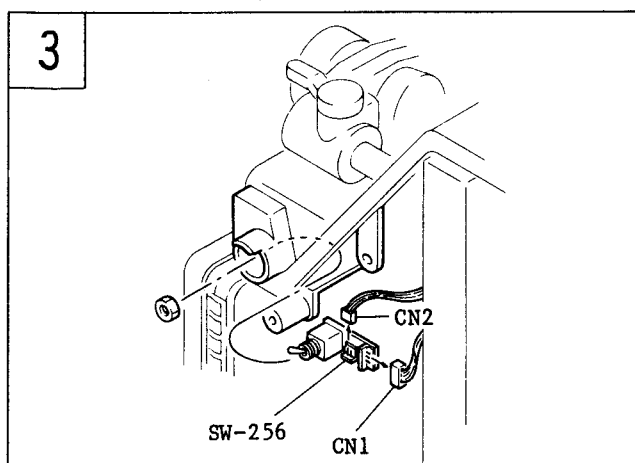
3. Unsolder and remove a switch to be replaced. Replace it with a new one.

2-4-2. Replacement of Shutter Switch

1. Remove the right side panel, referring to Section 2-1 "CABINET REMOVAL".
2. Remove the two screws (+B2.6x4). Disconnect the connector CN1 on the DR-72 board and remove the DR-72 board.



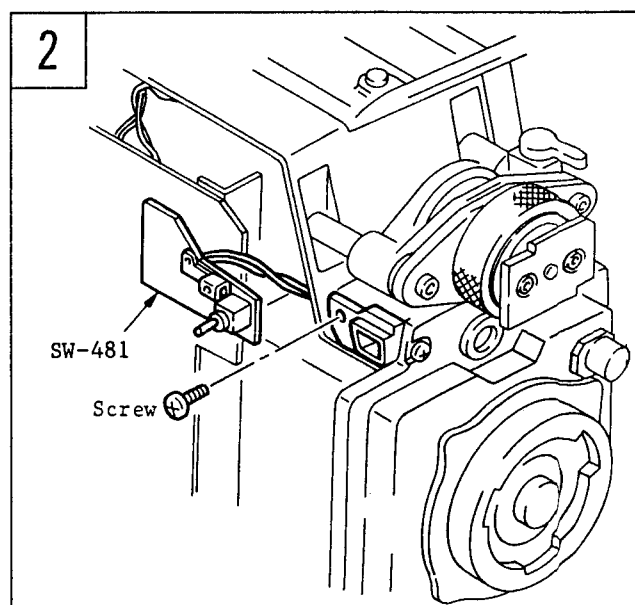
3. Disconnect the two connectors, CN1 and CN2 on the SW-256 board. Remove the nut securing the switch and pull out the SW-256 board with the switch mounted.



4. Unsolder and remove the switch. Replace it with a new one.

2-4-3. Replacement of Marker Switch

1. Remove the left side panel, referring to Section 2-1 "CABINET REMOVAL".
2. Remove the screw and pull out the SW-481 board with the switch mounted.



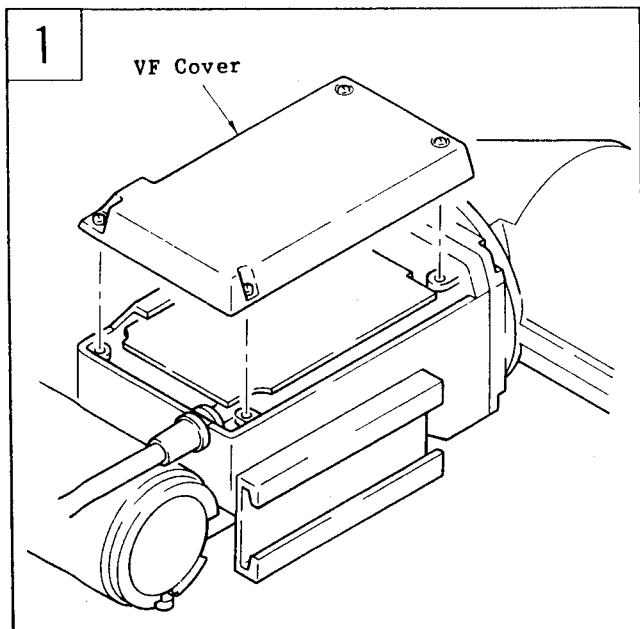
3. Unsolder and remove the switch. Replace it with a new one.

2-5. REPLACEMENT OF PARTS FOR VIEWFINDER

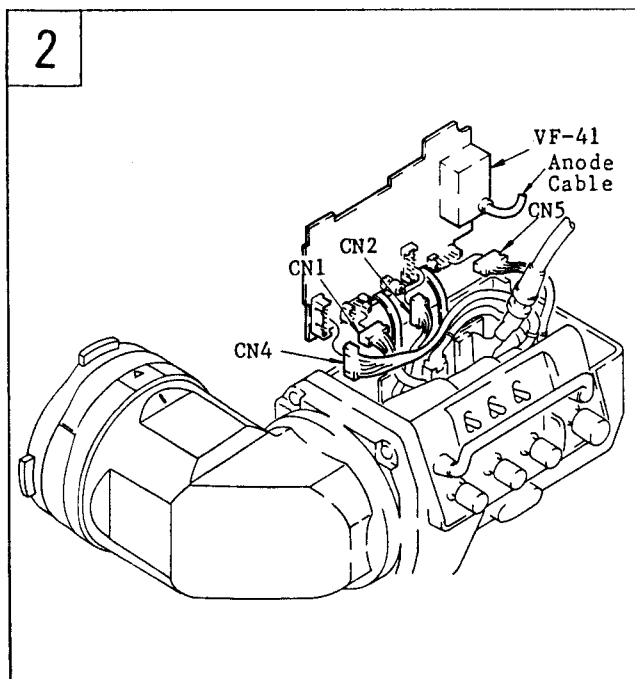
2-5-1. Replacement of CRT

DISASSEMBLE

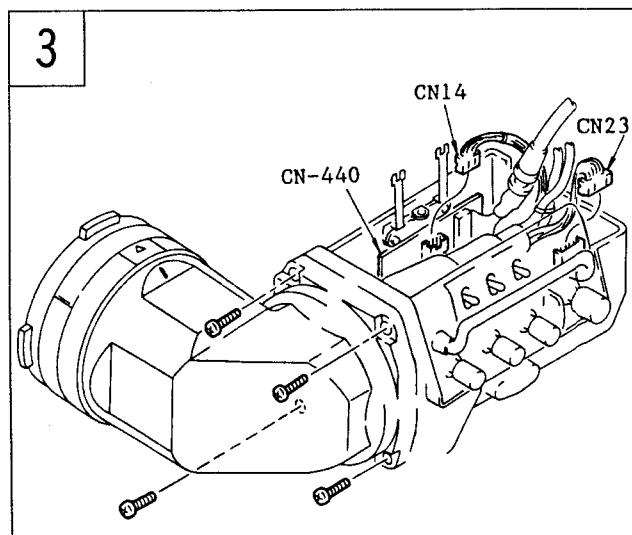
1. Loosen four screws and remove the VF cover.



2. Remove one screw and remove the VF-41 board. Disconnect the connector CN1, CN2, CN4, CN5 and anode cable on the VF-41 board.

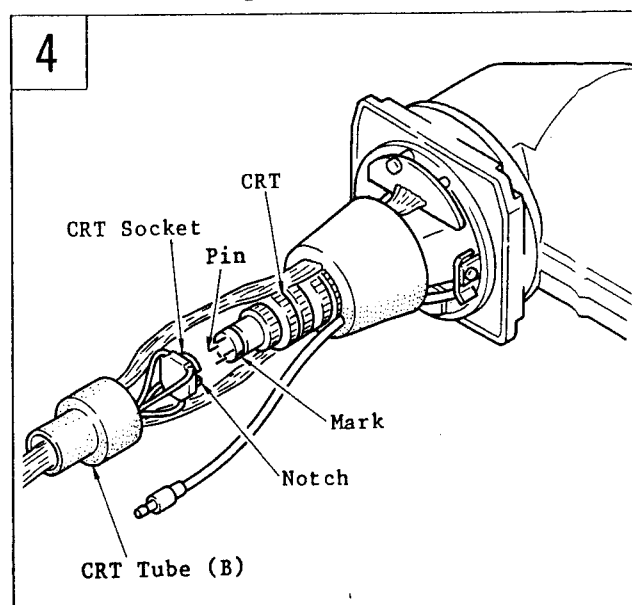


3. Loosen four screws and remove the VF tube. Disconnect the connector CN14 on the CN-440 board. Disconnect the connector CN23 on the VR-108 board.

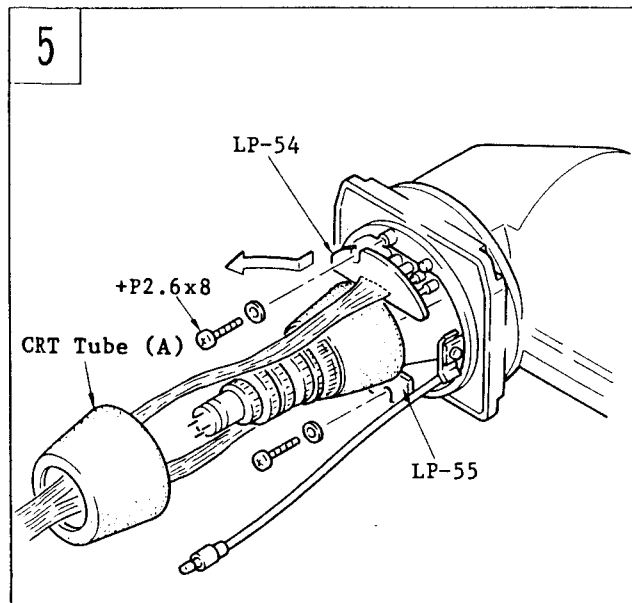


4. Remove the CRT tube (B). Disconnect the CRT socket from the CRT.

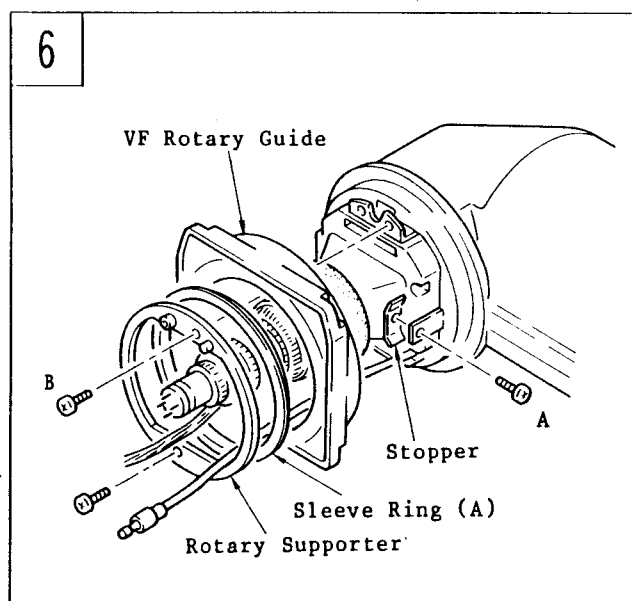
Note: When connecting the CRT socket to the CRT, match a mark on the CRT with a notch of the CRT socket. Be careful not to bend pins of the CRT while inserting.



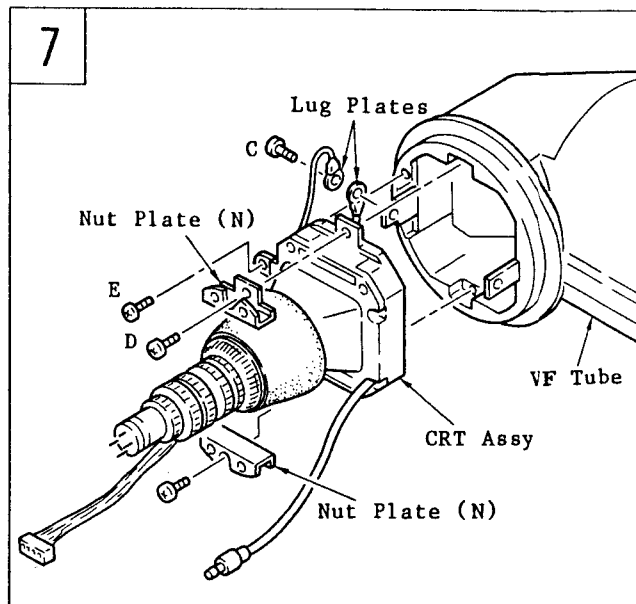
5. Remove the CRT tube (A). Remove two screws and remove the LP-54 and LP-55 board in the direction of arrow.



6. Remove the screw (A) and remove the stopper. Remove two screws (B) and remove the rotary supporter, sleeve ring (A), VF rotary guide.



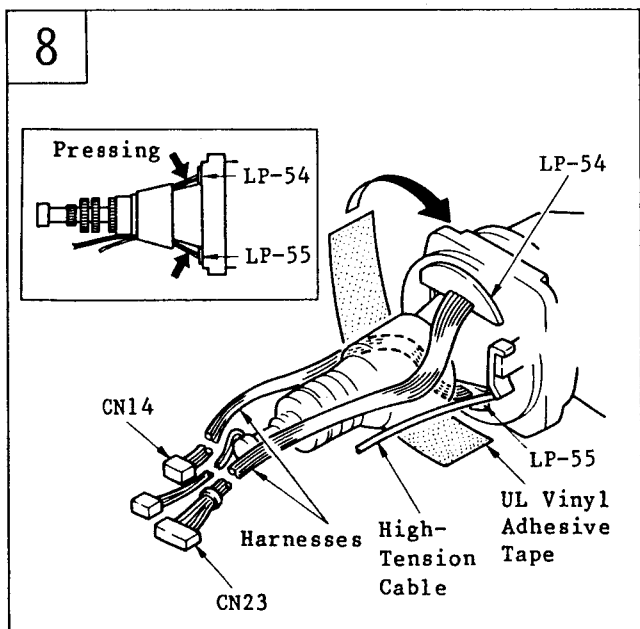
7. Remove the screw (C) and remove the two lug plates. Remove the screw (D) and remove the nut plate. Remove the screw (E). Remove the CRT ASSY from the VF tube.



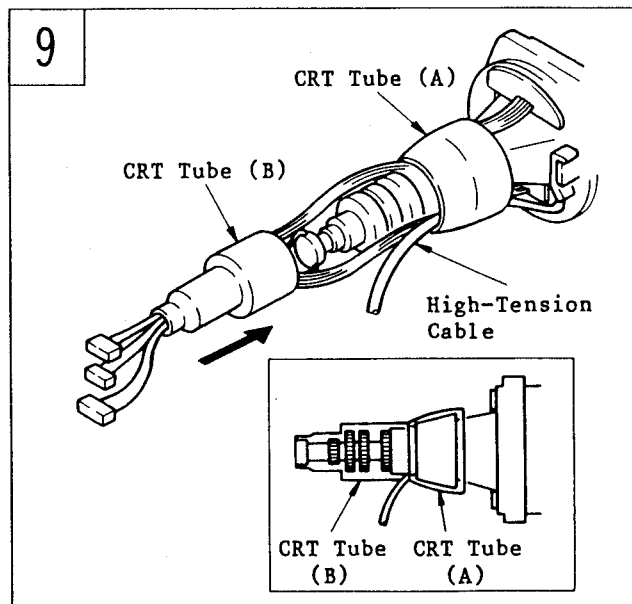
ASSEMBLE

Note: Assemble the viewfinder, taking care of harness arrangement.

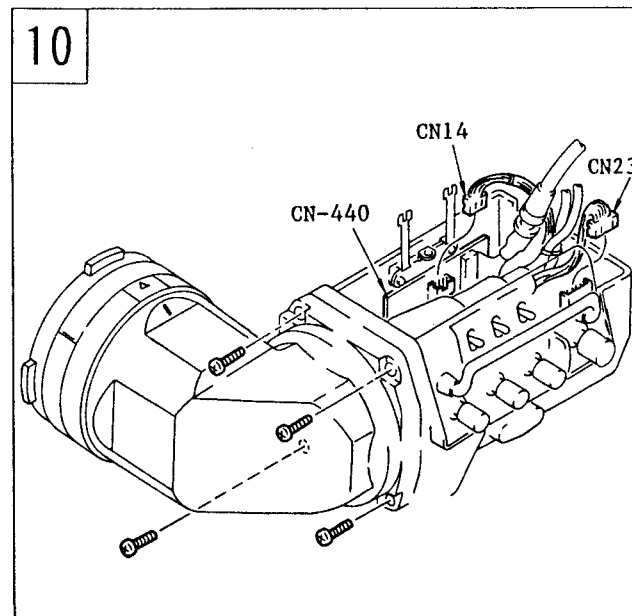
8. Assemble the viewfinder by reversing the procedures 6 and 7. Fix the LP-54 and LP-55 board with screws. Put all wire harnesses from the LP-54 and LP-55 boards together and fasten them with UL vinyl adhesive tape while pressing them in the direction shown by the arrows so that they are not laid on one another. The high-tension cable shall be kept straight. The tied harnesses should be pushed against the CRT so that they do not bulge out.



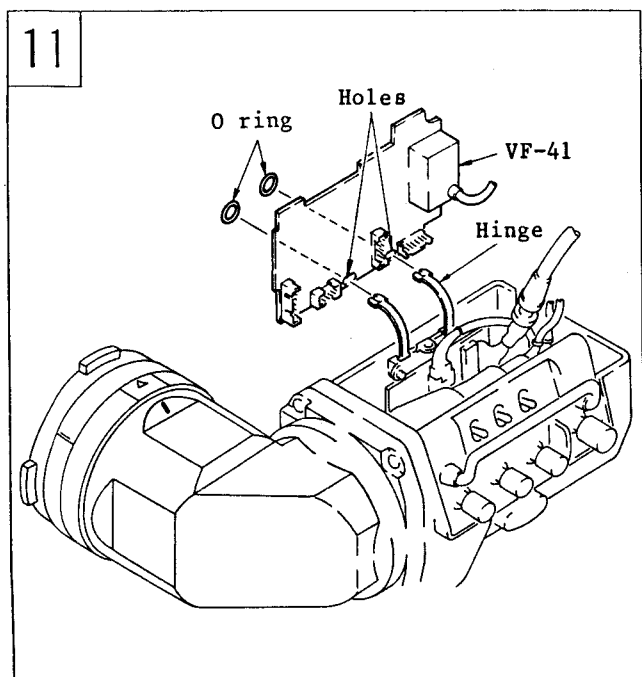
- 9 Cover the harnesses with CRT tubes (A) and (B) as shown in the figure. Care must be taken so that the harnesses are not slack within the tubes.



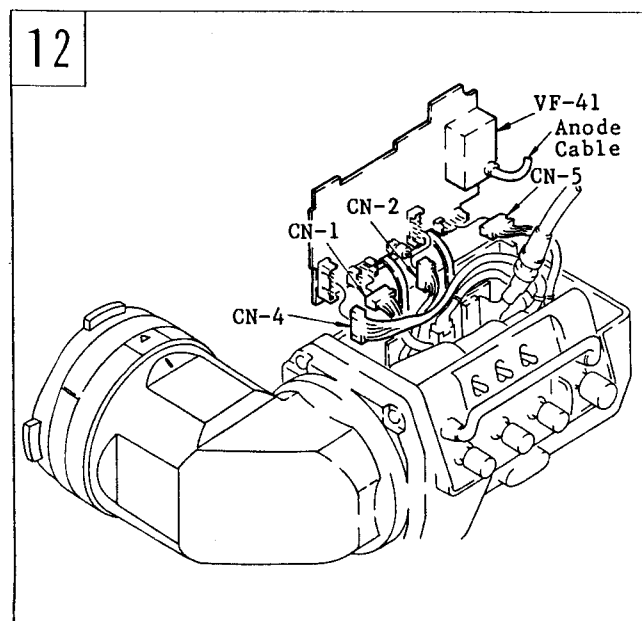
10. Install the VF tube, where the CRT is incorporated, into the VF body so that the harnesses are not placed between the tube and the body.
Connect the CN23 harness (from the LP-54 board) to the VR-78 board.
Connect the CN14 harness (from the LP-55 board) to the CN-440 board.



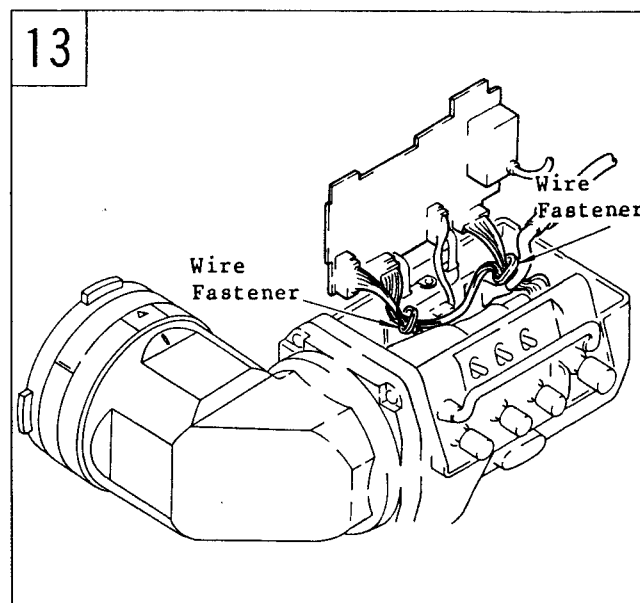
11. Insert the hinge into holes of the VF-41 board and secure it with the O ring.



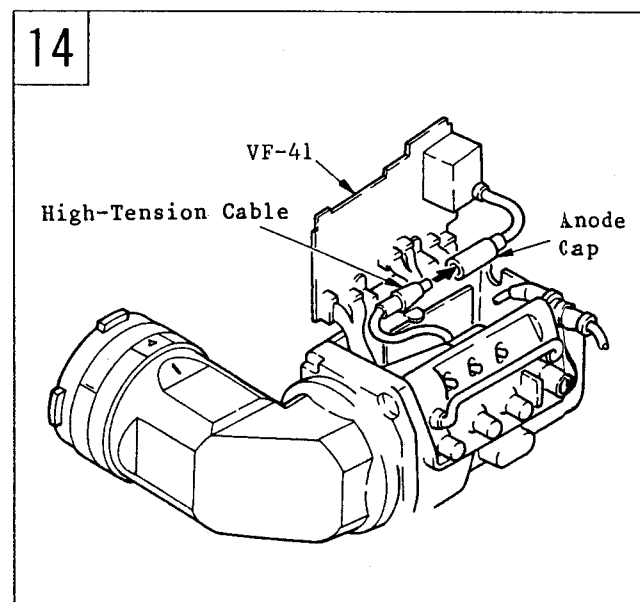
12. Connect CN1, CN2, CN4, and CN5 to the VF-41 board.



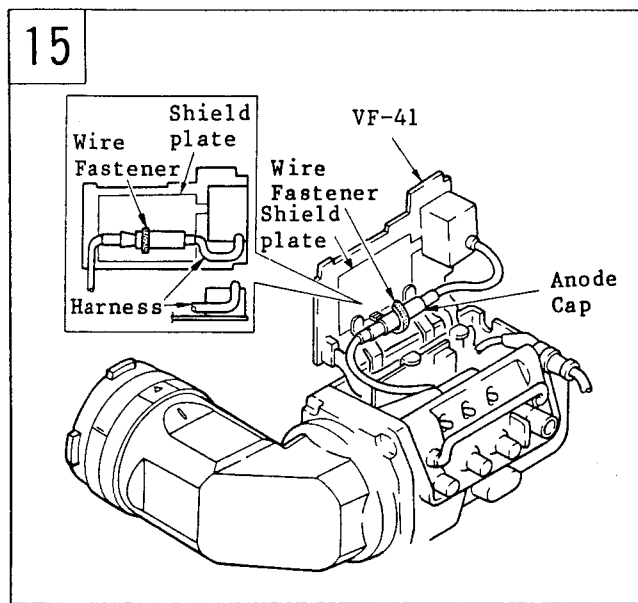
13. Clamp the harnesses with the wire fastener.



14. Insert the high-tension cable (from the CRT) into the anode cap of the VF-41 board until it locks.

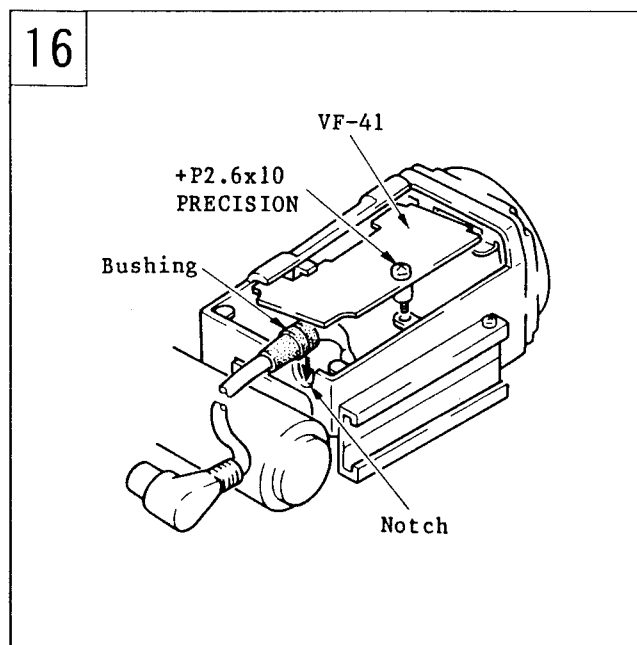


15. Clamp the anode cap in the place shown in the figure with the wire fastener piercing through the shielding plate and position the harness at the side of the transformer.

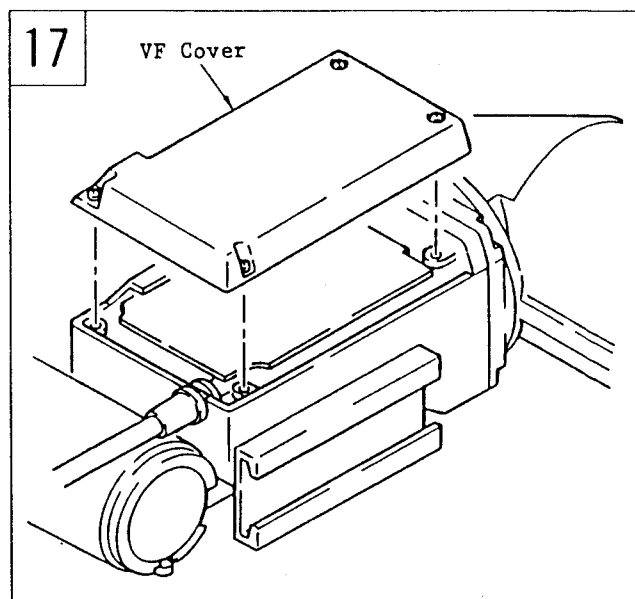


16. Insert the rubber bushing of the VF cable into the notch of the VF body so it matches the shape of the notch and close the VF-41.

Lastly, fasten the VF-41 with the supplied precision screw (+P2.6x10), with the board mounting metals.

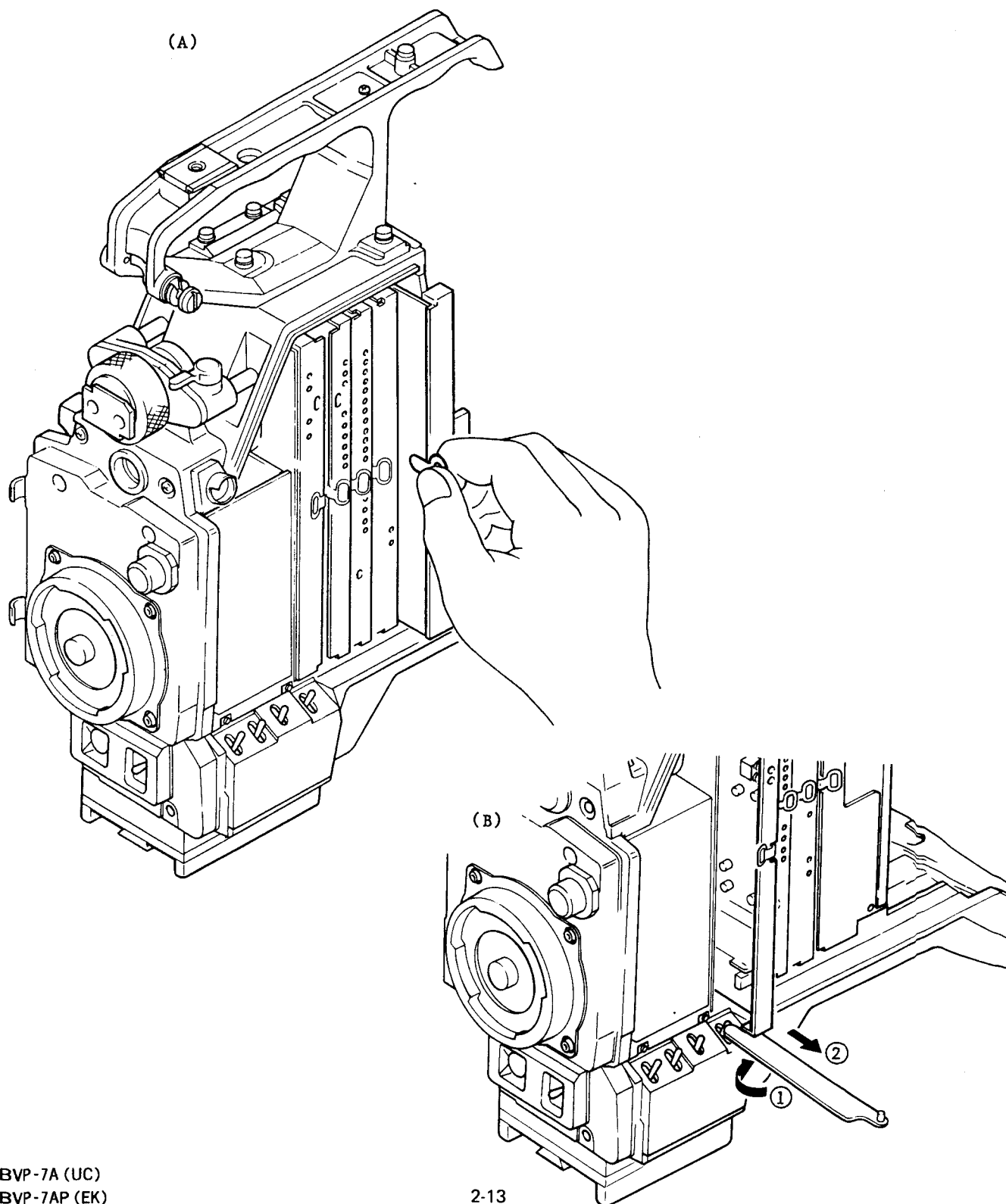


17. Install the VF cover.



2-6. EXTRACTING THE BOARDS

- (A) Pull the pull lever attached to each board toward you.
- (B) Put the board extractor (supplied accessory) in a hole at the bottom of the board. Move the board extractor in the direction of arrow ①, then pull it in the direction of arrow ②.

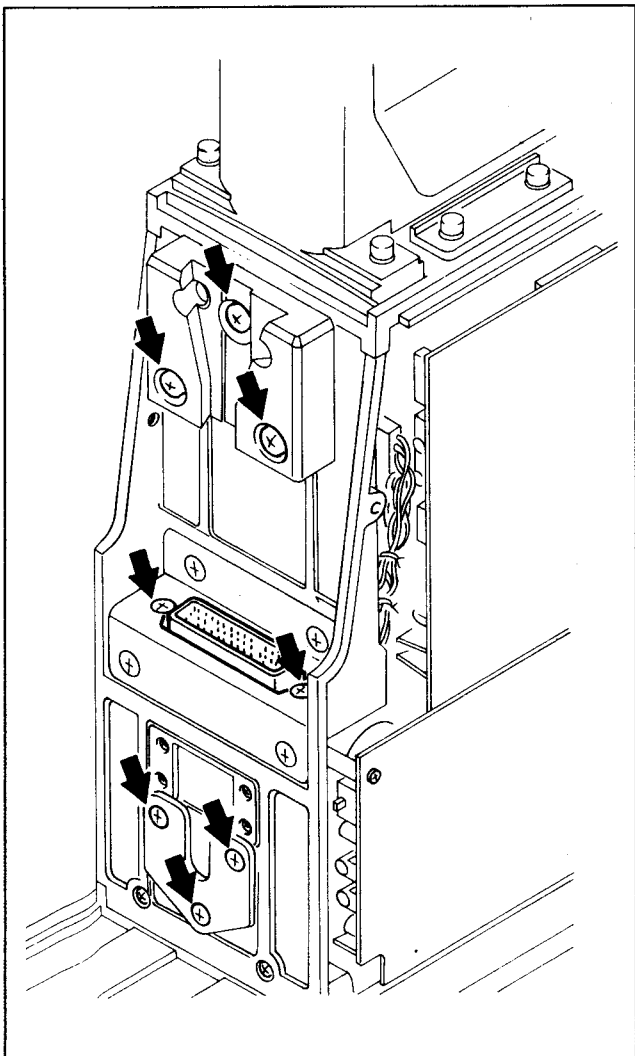


2-7. PRECAUTION ON REPLACEMENT OF VTR
CONNECTOR (50P CONNECTOR)

The VTR connector (50-pin connector), camera shoe and chassis should be accurately positioned respectively. When the above parts are replaced, it is necessary to adjust using a high-precision special tool (CV positioning tool) so as to keep the accurate relation and to dock with any of BVV-5.

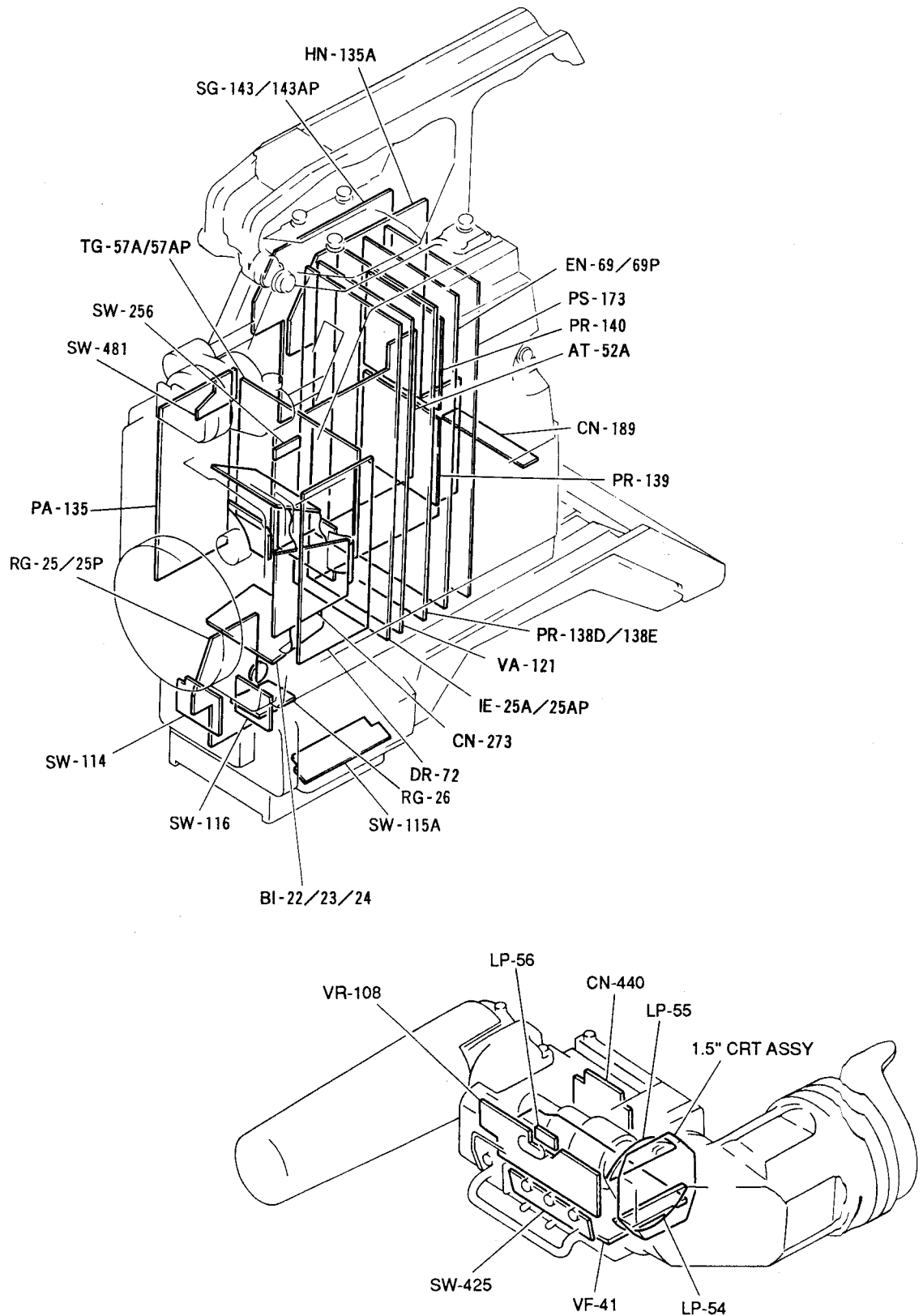
Avoid loosening or removing the eight screws shown in the figure.

For details, refer to "BETACAM CAMERA manual - Replacement of 50-pin connector -" prepared by Sony Corporation.



SECTION 3 SERVICE INFORMATION

3-1. MAIN PARTS LAYOUT



BVP-7A (UC)
BVP-7AP (EK)

3-2. CIRCUIT DESCRIPTION

- CCD CONTROL SYSTEM (TG-57A/57AP, DR-72, BI-22, 23, 24, PA-135 boards)

- . TG-57A/57AP board

It sends the pulse for driving the CCD to DR-72 board and the pulse for sampling the video signal output from the CCD to PA-135 board. Driving pulse synchronizes with the synchronizing signal sent from SG-143/143AP board.

14MHz counted down from 28MHz is also supplied to SG-143/143AP board.

- . DR-72 board

It converts the driving pulse sent from TG-57A/57AP board so as to drive the CCD directly. Converted pulse is sent to BI-22, 23, 24 boards and transmitted to the CCD.

- . BI-22, 23, 24 boards

It mounts the CCD. Driving pulse and DC voltage for control are added to the CCD on the board.

The video signal output from the CCD is sent through the emitter follower to PA-135 board.

- . PA-135 board

It eliminates the pulse component of the video signal sent from BI-22, 23, 24 boards. Then the signal processings such as the black level fixing and amplification by preamplifier are performed on the board, then the video signal is sent to VA-121 board.

- VIDEO SIGNAL SYSTEM (VA-121, IE-25A/25AP, PR-138E/138D, EN-69/69P boards)

- . VA-121 board

It amplifies the video signal sent from PA-135 board and processes the black shading correction gain-up control, blanking cleaning and white shading correction. It also selects the video signal or the TEST SAW signal.

- . IE-25A/25AP board

It generates the detail signal obtained from G and R video signal so as to improve resolution. The detail signal is sent to PR-138A/138B board, then added to R, G and B video signals.

G video signal is delayed by 1H, then sent to PR-138D/138E board.

- . PR-138D/138E board

The masking signal and detail signal are added to R, G and B video signals respectively and the flare compensation, pedestal control, knee correction, white clipping and gamma correction are performed on the board. Then the video signal is sent to EN-69/69P board.

- . EN-69/69P board

It generates the luminance (Y) signal, color difference (B-Y, R-Y) signals and composite video (VBS) signal obtained from R, G and B video signals. It also supplies the SMPTE: NTSC (EBU:PAL) color-bar signals.

- POWER SUPPLY SYSTEM (PS-173 board)

- . PS-173 board

Externally supplied unregulated DC power is sent to the switching regulator, DC to DC converter and series regulator to generate voltages of +8.8VDC, +5VDC and -5VDC for the respective boards.

It also supplies voltages for the VIEWFINDER and for CCD control.

- SYNCHRONIZING SIGNAL SYSTEM (SG-143/143AP board)

- . SG-143/143AP board

It generates various synchronizing signals.

It detects the genlock signal automatically and synchronizes with it.

- AUTOMATIC CONTROL SYSTEM (AT-52A, PS-173 boards)

- . AT-52A board

Microcomputer unit on AT-52A board sends to the control signal and compensation signal to appropriate boards in accordance with the selection of function switches.

It also detects the internal temperature, position of color temperature conversion filter, PEDESTAL control and video level automatically, then compensates the video signals and displays various warnings.

- . PS-173 board

If contains the auto iris circuit and VTR-CAMERA interface circuit.

The former detects the video level at any time and adjusts the iris control.

The latter controls the input and output of the START/STOP control signal and warning signal between camera and VTR.

3-3. SERVICING PRECAUTION

3-3-1. Precautions on Replacement of VTR Connector (50P Connector)

The VTR connector (50 pin connector) is attached using a high-precision special tool (CV positioning) so as to keep the accurate positioning relation with VTR mount (C shoe) and to dock with any of BVV-1/1PS, BVV-1A/1APS and BVV-5/5PS.

Avoid to loosen or remove the screws for 50P connector, C SHOE and stopper (in all, eight screws).

It is necessary to adjust using a jig, when the above parts are replaced.

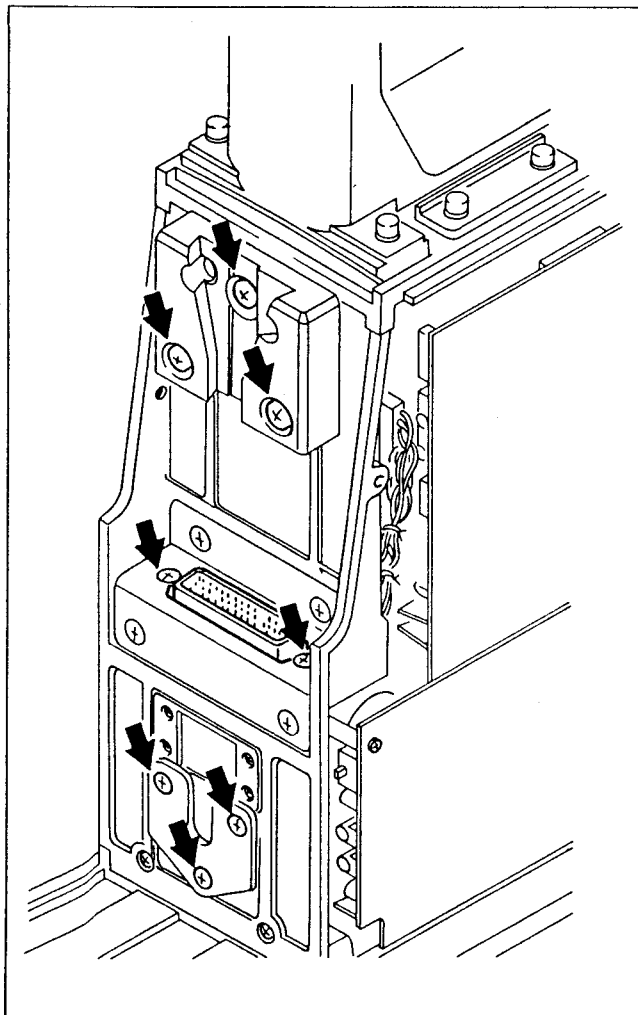
For replacement of the VTR connector (50-pin connector), contact your Sony dealer.

3-3-2. Warning of CCD Image Sensor Replacement

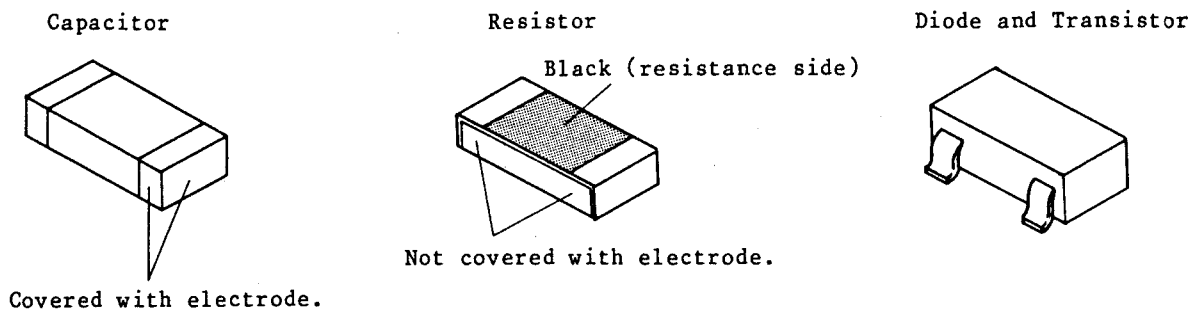
The BI-22, 23, 24 boards on which the CCD is mounted had better not be removed.

When removing it, the CCD is occasionally broken by the static electricity.

If the CCD is broken, the whole CCD unit must be replaced.



3-3-3. Precaution on Replacement of Chip Parts



Tools required:

Soldering iron of approx. 20W

(Use a temperature controller, if possible, which can control the iron temperature to $270\pm10^{\circ}\text{C}$.)

Braided wire (SOLDER TAUL)

Solder (A solder of 0.6mm in diameter is recommended.)

Tweezers

Soldering conditions:

Iron temperature of $270\pm10^{\circ}\text{C}$

A connector should be soldered within 2 seconds.

The chip parts removed should not be used again.

For details, refer to CHIP COMPONENTS MANUAL, Sony's parts No. 9-972-289-91 prepared by Sony Corporation.

Procedures

1. To remove a resistor or capacitor, place the tip of a soldering iron on chip parts to heat the parts, and then move it horizontally for removal while being desoldered. For removal of a diode or transistor, heat the one side, with two pins, of chip parts at the same time, set the parts up when desoldered, and remove the two pins. And then, remove the pin on another side.
2. Absorb solder by using a braided wire to smooth the land surface of board after removal.
3. Confirm by visual check that no trace of the removed chip parts is peeled off and no adjacent parts is damaged or bridged.
4. Perform a thin pretinning on the trace.
5. Place new chip parts on the trace to solder its both sides.

3-3-4. Precaution of Replacement Parts

1. Safety Related Components Warning

Components identified by shading marked with $\triangle$ on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service manual supplements published by Sony.

2. Standardization of Parts

Replace Parts that are supplied from Sony Parts Center can sometimes have different shape and external appearance than what are actually used in equipment. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts."

- . This manual's exploded view and electrical spare parts lists are indicating the parts numbers of "the standardized genuine parts at present."
- . Regarding engineering parts and diagrams changes in our engineering department, refer Sony service bulletins and service manual supplements.

3. Stocked of Parts

The parts marked with "S" in the SP column of the exploded views and electrical spare parts list are normally required for routine service work. Orders for parts marked with "O" will be proceed, but allow for additional delivery time.

4. Units of Capacitors, Inductors, and Resistors

The following units are omitted in the schematic diagrams, exploded views, and electrical part lists unless otherwise specified;

Capacitor: μF

Inductor : μH

Resistor : Ω

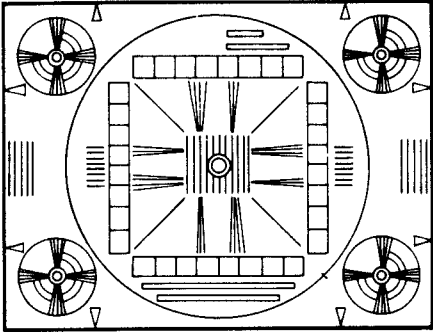
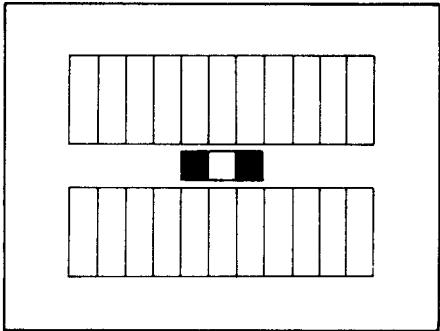
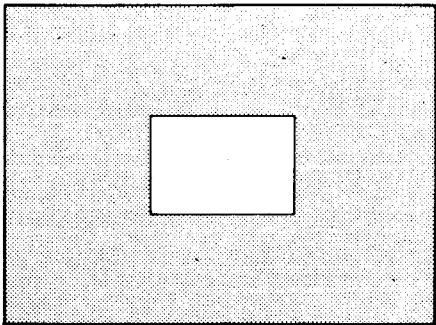
3-4. TOOLS AND JIGS

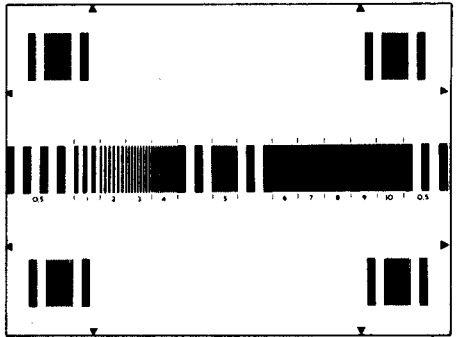
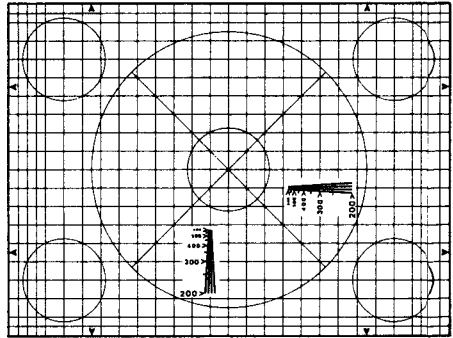
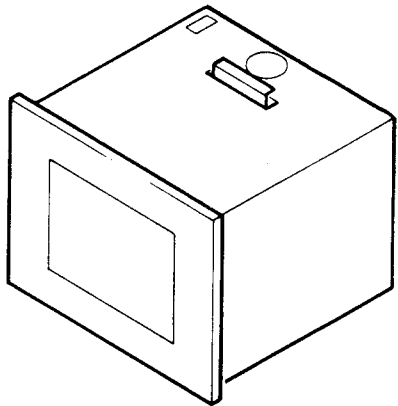
Part No.	Description
A-7520-253-A	Extension board "EX-108" (supplied)
J-6026-100-A	Resolution chart
J-6026-110-A	Multi-burst chart
J-6026-120-A	Registration chart
J-6026-130-B	Gray-scale chart
J-6029-140-A	Pattern box "PTB-500"
J-6196-080-B	DC Power cord
3-692-589-01	Board Extractor
7-700-733-01	Adjusting screwdriver (1.5mm/4mm)

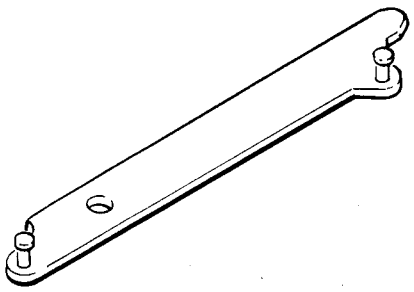
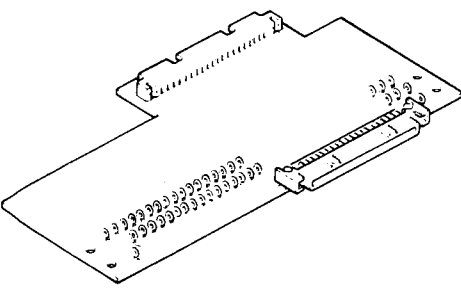
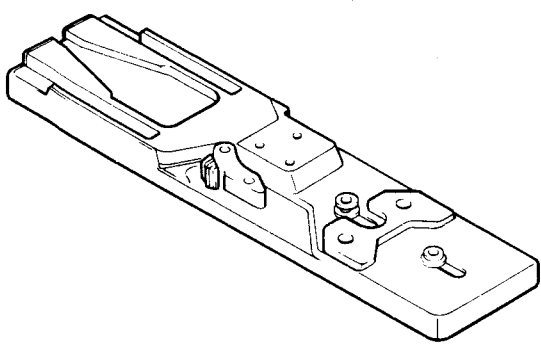
SECTION 4 ALIGNMENT

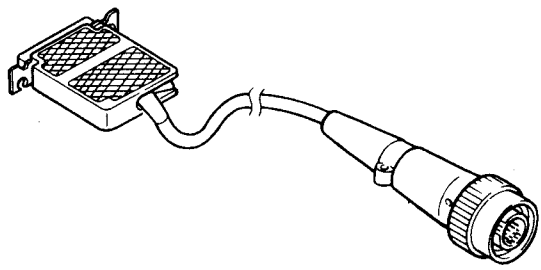
4-1. PREPARATION

4-1-1. Adjustment Fixtures and Equipments

J-6026-100-A	Resolution Chart
	
J-6026-130-A Grayscale Chart Stick the velvet (black) at the both sides of white pattern in the center so as to avoid the light leakage. 	
White Window Chart	
Make a hole in the center of black paper as shown in the figure. 	

J-6026-110-A	Multiburst Chart
	
J-6026-120-A Registration Chart 	
J-6029-140-A Pattern Box PTB-500 (90 to 240 Vac) with Color-bar Chart attached 	

3-692-589-01	Board Extractor
	
A-7520-253-A	Extension board (EX-108)
	
	Tripod Adaptor (VCT-14)
	

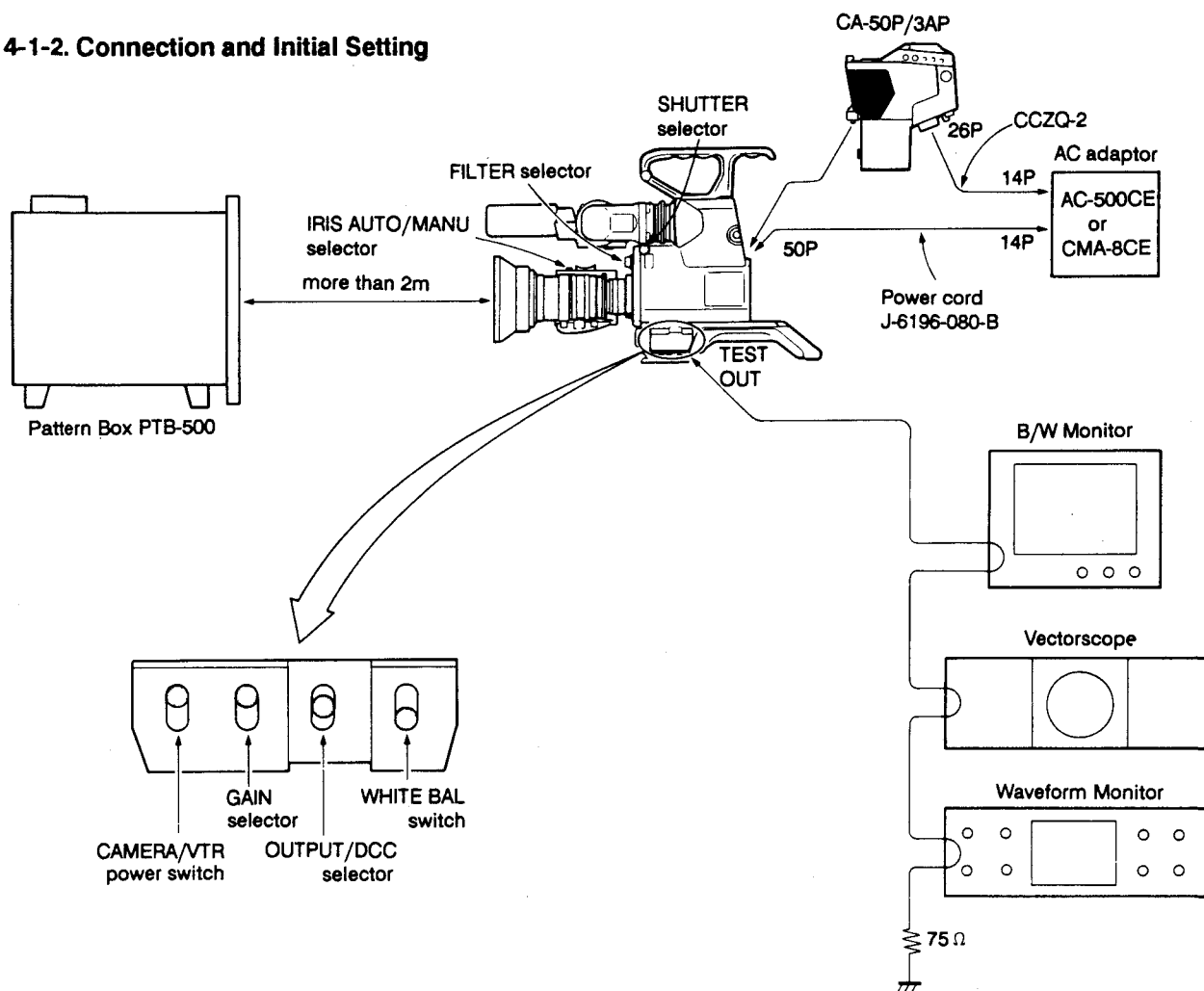
J-6196-080-B	DC Power Cord
Necessary without CA-50P/3AP	
	

- Camera Adaptor (Sony CA-50P/3AP)
- AC Adaptor (Sony AC-500CE or CMA-8CE)
- CF Pulse Generator (Sony BVG-10P)

Measuring Instruments

- Oscilloscope
- Waveform Monitor
- Vectorscope
- Frequency Counter
- Digital Voltmeter
- B/W Monitor (H. Resolution: more than 700 TV lines)

4-1-2. Connection and Initial Setting



1. Before adjustments, set the CAMERA/VTR power switch to "ON/STBY" position and warm up for ten minutes.
2. Reset the compensation data in the microprocessor.
(See 4-1-3. precautions on Adjustments)
3. Set the camera switches and controls as follows.

[Side panel]

CAMERA/VTR power switch : ON/STBY
 GAIN selector : 0
 OUTPUT/DCC selector : CAM/OFF
 WHITE/BAL switch : PRESET
 FILTER selector : 1 (3200°K)
 IRIS AUTO/MANU selector : MANU
 IRIS control : CLOSE
 SHUTTER switch : OFF

[IE-25AP Board]

S1 **DTL** : OFF
 S2 **APERTURE** : OFF

[PR-138E Board]

S1 **MASKING** : OFF

4-1-3. Precautions on Adjustments

* Boards Extension

When IE-25AP, VA-121, PR-138E, EN-69P and SG-143P boards are extended or returned, be sure to set the CAMERA/VTR power switch to PRE HEAT position. When PS-173 board is extended or returned, be sure to set the switch of original power supply to OFF position.

* Procedure of Resetting Compensation Data

Before step 23. Black Set Pedestal Adjustment and step 24. Flare Adjustment are carried out, the compensation data in the microprocessor must be reset in following order.

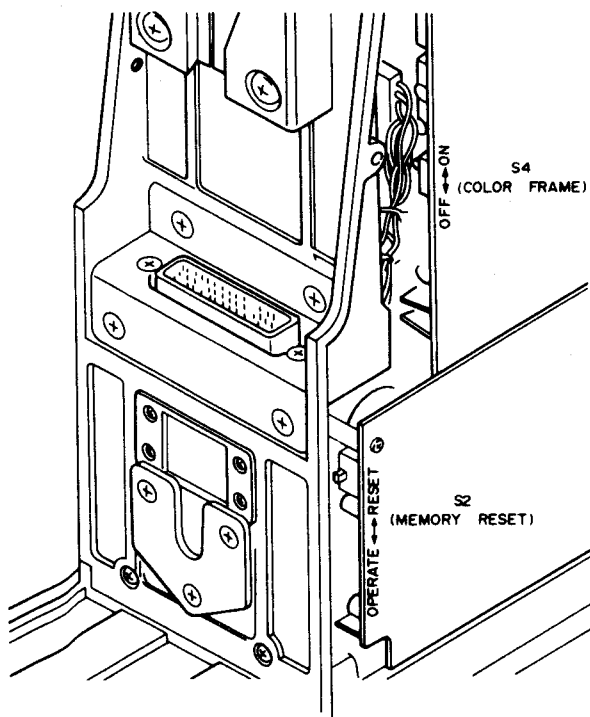
1. S2 (MEMORY RESET)/AT-52A board → RESET
2. CAMERA/VTR power switch (side panel) → PRE HEAT/SAVE

Keep this switch position for ten seconds.

3. CAMERA/VTR power switch (side panel) → ON/STBY

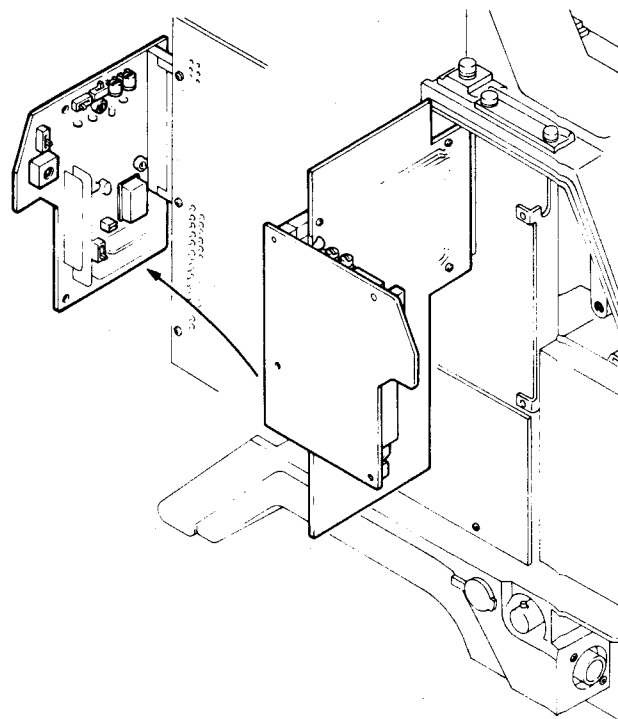
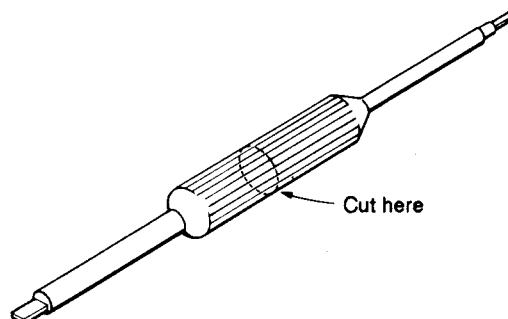
4. S2 (MEMORY RESET)/AT-52A board → OPERATE
- When the AUTO W/BAL switch is not set to BLK or WHT position, the compensation data remains cleared (initial condition).

When the S2 (MEMORY RESET)/AT-52A board switch is set to RESET position, the compensation data is reset whenever the CAMERA/VTR power switch is set to OFF/SAVE position. Set the S2 switch to RESET position during adjustment.



* SG-143P board Adjustment

When step 5. SYNC Width Adjustment, step 8. H BLKG Adjustment and step 10. INT SC Phase Adjustment are carried out, a screw driver with short handle is necessary for adjustments.



* Partial Adjustment

When performing partial adjustment, refer to 4-3. PARTIAL ADJUSTMENT.

* Earthing Point

Use the GND terminal on the extension board, unless otherwise specified.

4-2. OVERALL ADJUSTMENT

Power supply system	Step 1. DC Bias Adjustment	Detail signal system	Step 39. White Clip Adjustment
	Step 2. Switching Freq Adjustment		Step 40. Streaking Adjustment
	Step 3. +9.3 V/+8.8 V Adjustment		Step 41. V DTL Null Adjustment
Synchronizing signal system	Step 4. Subcarrier Frequency Adjustment	Auto control system	Step 42. 1H, 2H DELAY Signal Phase Adjustment
	Step 5. SYNC Width Adjustment		Step 43. H DTL Adjustment
	Step 6. SYNC Phase Adjustment		Step 44. Black Balance Adjustment
	Step 7. Burst Flag Adjustment		Step 45. Crispening Adjustment
	Step 8. H BLKG Width Adjustment		Step 46. Level Dependent Adjustment
	Step 9. V BLKG Width Adjustment		Step 47. APERTURE DTL NULL Adjustment
	Step 10. INT SC Phase Adjustment		Step 48. APERTURE Waveform Adjustment
	Step 11. Pre DC Balance Adjustment		Step 49. H/V RATIO Adjustment
	Step 12. R/B Black Offset Adjustment		Step 50. Detail Level Adjustment
	Step 13. VA Gain Adjustment		Step 51. Resolution Adjustment
Video signal system	Step 14. DC Balance Adjustment	View-finder system	Step 52. VF Marker B/W Level Adjustment
	Step 15. Test Signal Waveform Adjustment		Step 53. Power Save Adjustment
	Step 16. Pre Knee Adjustment	View-finder system	Step 54. Auto Iris Adjustment
	Step 17. Modulator Balance Adjustment		Step 55. LOW VIDEO Adjustment
	Step 18. Black Shading Adjustment	View-finder system	Step 56. Character Size Adjustment
	Step 19. White Shading Adjustment		Step 57. Preparation for Viewfinder System Adjustment
	Step 20. PR IN Gain Adjustment		Step 58. Vertical Hold Adjustment
	Step 21. Flare DC Balance Adjustment		Step 59. Horizontal Hold Adjustment
	Step 22. Gamma Balance Adjustment		Step 60. DC Balance Adjustment
	Step 23. Carrier Balance Adjustment		Step 61. BRIGHT SET Adjustment
	Step 24. Black Set Pedestal Adjustment		Step 62. Focus Adjustment
	Step 25. Flare Adjustment		Step 63. Picture Frame Adjustment
	Step 26. PR OUT Gain Adjustment		Step 64. Peaking Adjustment
	Step 27. RGB Video Level Adjustment		
	Step 28. EN Y Level Adjustment		
	Step 29. Color-bar Adjustment		
	Step 30. UV Gain Adjustment		
	Step 31. Burst Adjustment		
	Step 32. VTR Y Adjustment		
	Step 33. VTR R-Y Adjustment		
	Step 34. VTR B-Y Adjustment		
	Step 35. Zebra Level Adjustment		
	Step 36. Gamma Correction Adjustment		
	Step 37. Manual Knee-White Clip Adjustment		
	Step 38. Automatic Knee Adjustment		

NOTE

Do not attempt to reset the following controls because their adjustments are very critical and delicate in the field.

- | | |
|-----------------|-------------------|
| RV2/TG-57 board | CV1/VA-121 board |
| RV3/TG-57 board | CV2/VA-121 board |
| RV4/TG-57 board | CV3/VA-121 board |
| RV1/DR-72 board | CV1/IE-25AP board |
| RV2/DR-72 board | RV9/IE-25AP board |
| RV3/DR-72 board | CV1/PR-138E board |
| | CV2/PR-138E board |
| | CV3/PR-138E board |
| | CV1/EN-69P board |

Step 1. DC Bias Adjustment

■ Note

- The adjustment is not necessary if error is within $\pm 3\%$ of rated voltage.
- When performing this adjustment, be sure to readjust all of the following (to Step 64. Peaking Adjustment).

■ Setting

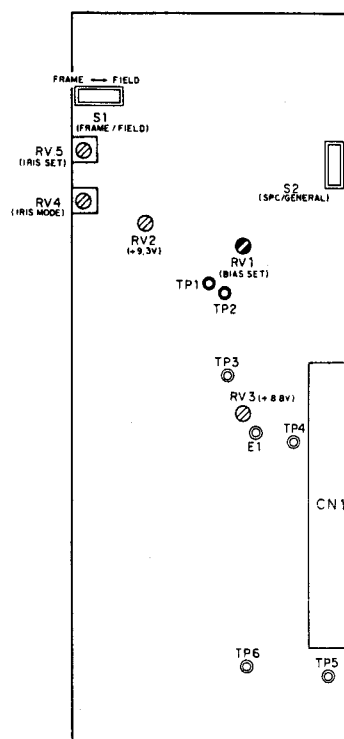
Equipment : Digital Voltmeter	To be extended : PS-173 board
-------------------------------	-------------------------------

■ Adjustment procedures

Test Point : Measure TP1 between TP1 (+) and TP2 (-)
on the PS-173 board

Adj.point : ● RV1 (BIAS SET)/PS-173 board

Spec. : $+1.83 \pm 0.01$ Vdc



PS-173 BOARD (COMPONENT SIDE)

Step 2. Switching Freq Adjustment

■ Note

- The adjustment is not necessary if error is within $\pm 2\%$ of rated voltage.

■ Setting

Equipment : Frequency Counter

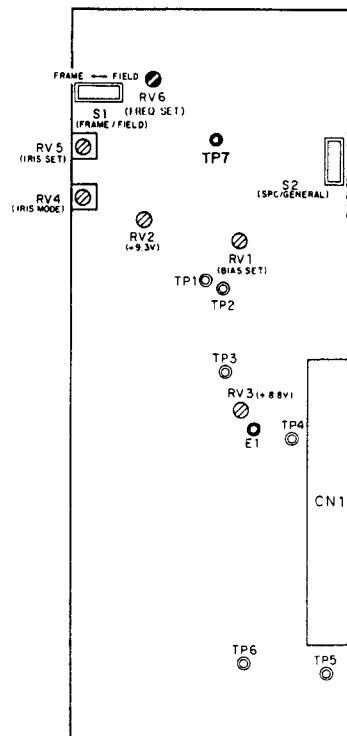
To be extended : PS-173 board

■ Adjustment procedures

Test Point : TP7 (GND: E1)/PS-173 board

Adj. Point : $\odot$ RV6 (FREQ SET)/PS-173 board

Spec. : 40.4 ± 0.8 kHz



PS-173 BOARD (COMPONENT SIDE)

Step 3. +9.3 V/+8.8 V Adjustment

■ Note

- The adjustment is not necessary if error is within $\pm 3\%$ of rated voltage.
- When performing this adjustment, be sure to readjust all of the following (to Step 64. Peaking Adjustment.).

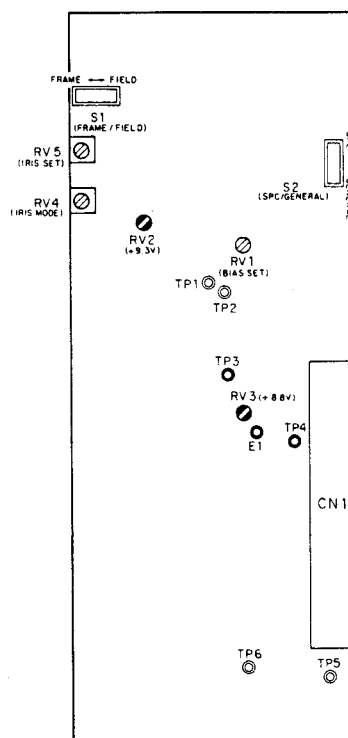
■ Setting

Equipmet : Digital Voltmeter

To be extended : PS-173 board

■ Adjustment procedures

	Test point/PS-173	Adj. point/PS-173	Specification
+9.3V Adjustment	TP3 (GND: E1)	RV2	$+9.3 \pm 0.01$ Vdc
+8.8V Adjustment	TP4 (GND: E1)	RV3	$+8.8 \pm 0.01$ Vdc



PS-173 BOARD (COMPONENT SIDE)

Step 4. Subcarrier Frequency Adjustment

- Note

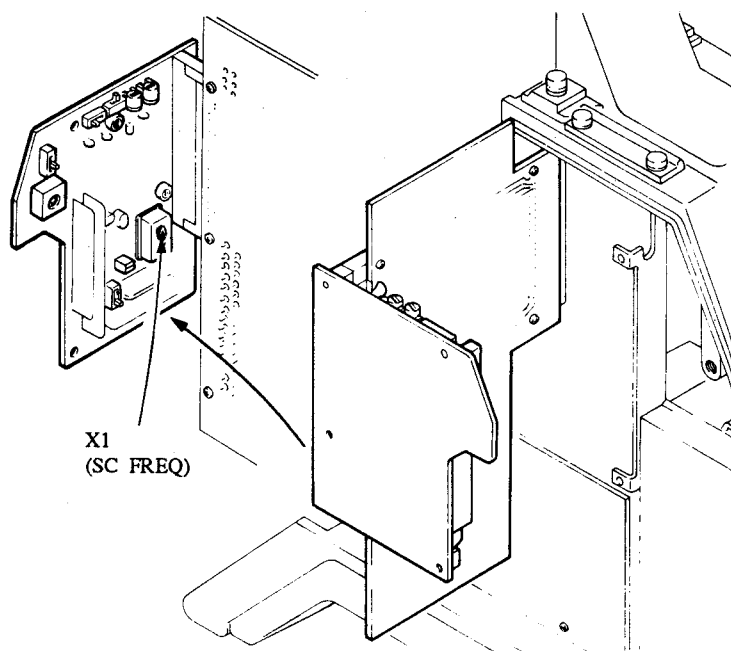
- Before adjustment, set the CAMERA/VTR power switch to ON/STBY position and warm up for ten minutes.
- Make sure that the camera is not in GENLOCK mode.

- Setting

Equipment : Frequency Counter	To be extended : SG-143P board
-------------------------------	--------------------------------

- Adjustment procedures

Test point : TP26 (GND:TP25)/extension board
Adj. point : ● X1 (SC FREQ) /SG-143P board
Spec. : 4,433,619 $\pm$ 5 Hz



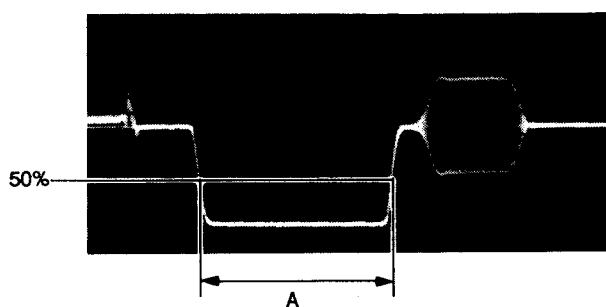
Step 5. SYNC Width Adjustment

■ Setting

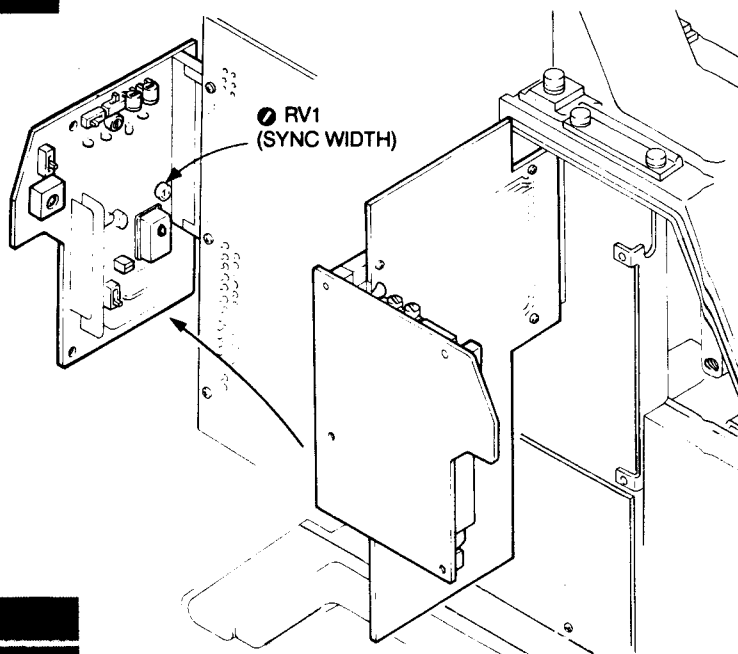
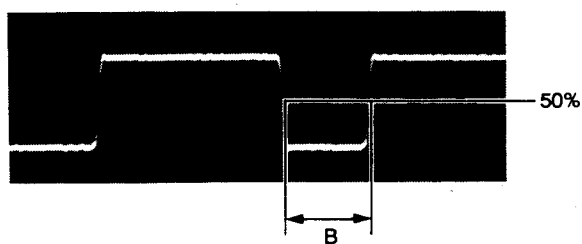
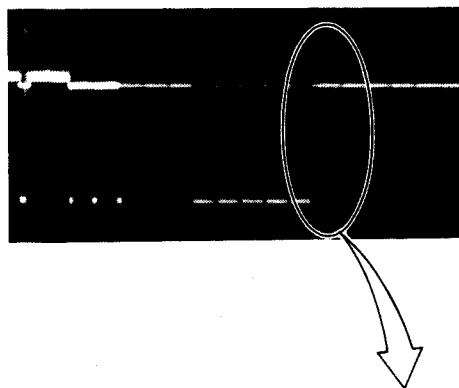
Equipment : Waveform monitor (WFM)	To be extended : SG-143P board
------------------------------------	--------------------------------

■ Adjustment procedures

1. ENC/RGB switch (side panel) → "ENC"
2. Test point: TEST OUT terminal
Adj. point: ⓪ RV1 (SYNC WIDTH)/SG-143P board
Spec. : A = $4.7 \pm 0.1 \mu\text{s}$
B = $2.3 \pm 0.1 \mu\text{s}$



V BLKG



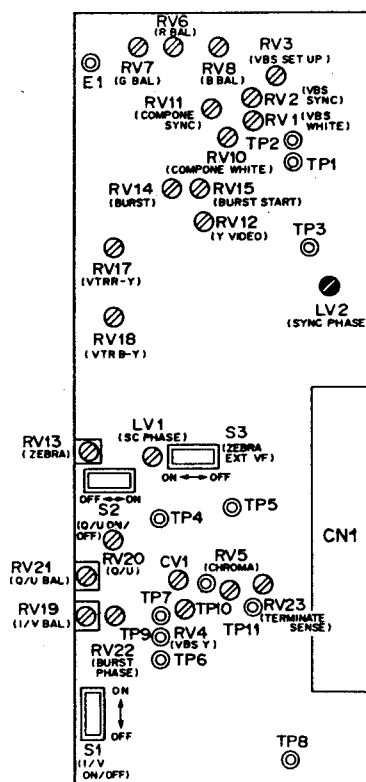
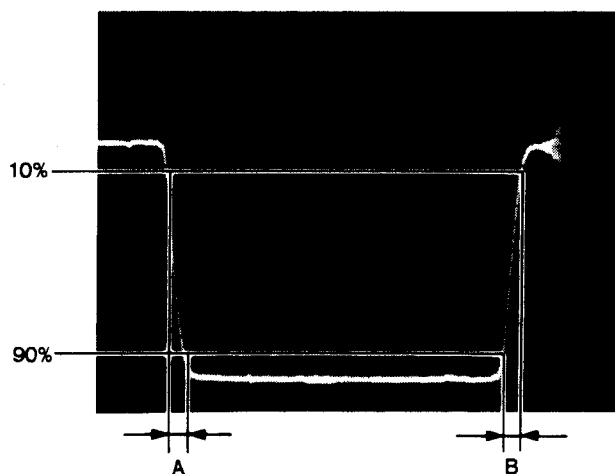
Step 6. SYNC Phase Adjustment

■ Setting

Equipment : Oscilloscope	To be extended : EN-69P board
--------------------------	-------------------------------

■ Adjustment procedures

1. ENC/RGB switch (side panel) → "ENC"
2. Test point: TP9 (GND:TP11)/extension board
Adj. point: ● LV2 (SYNC PHASE)/EN-69P board
Spec. : $A = B = 0.25 \pm 0.05 \mu s$
(Adjust so as to disappear the overshoot and undershoot.)



EN-69/69P BOARD (COMPONENT SIDE)

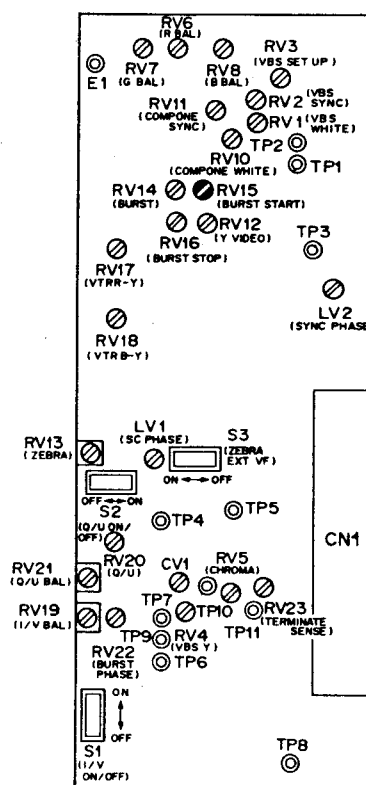
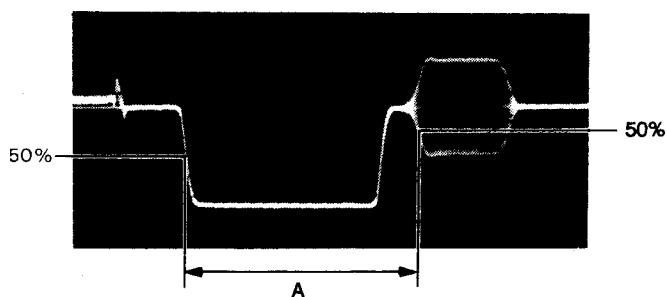
Step 7. Burst Flag Adjustment

■ Setting

Equipment : Waveform monitor (WFM)	To be extended : EN-69P board
------------------------------------	-------------------------------

■ Adjustment procedures

1. ENC/RGB switch (side panel) → "ENC"
2. Test point: TEST OUT terminal
Adj.point : ● RV15 (BURST START)/EN-69P board
Spec. : $A = 5.6 \pm 0.1 \mu s$



EN-69/69P BOARD (COMPONENT SIDE)

Step 8. H BLKG Width Adjustment

■ Setting

Equipment : Waveform monitor (WFM)	To be extended : SG-143P board
Object : White window chart	

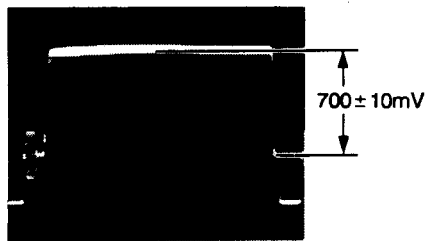
■ Preparation

1. Pattern box
 - When the pattern box is PTB-220, set AUTO/MANU switch at "AUTO".
 - When the pattern box is PTB-500, insert the filter unit.
2. Shoot so that the white window frame touches the underscanned picture frame on the monitor.
3. ENC/RGB switch (side panel) → "ENC"

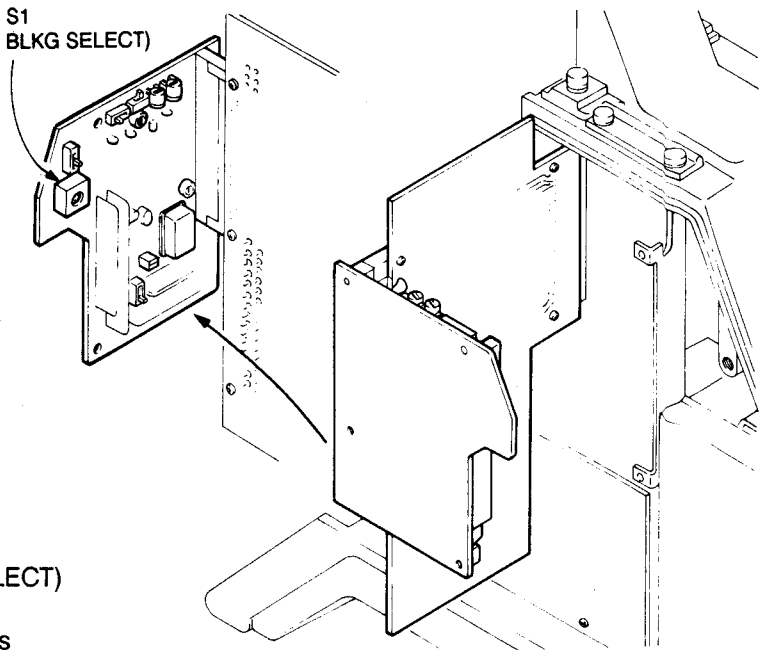
■ Adjustment procedures

Test point: TEST OUT terminal

Adjust : 1. Adjust the iris control so that the video level at TEST OUT terminal is 700 ± 10 mV.

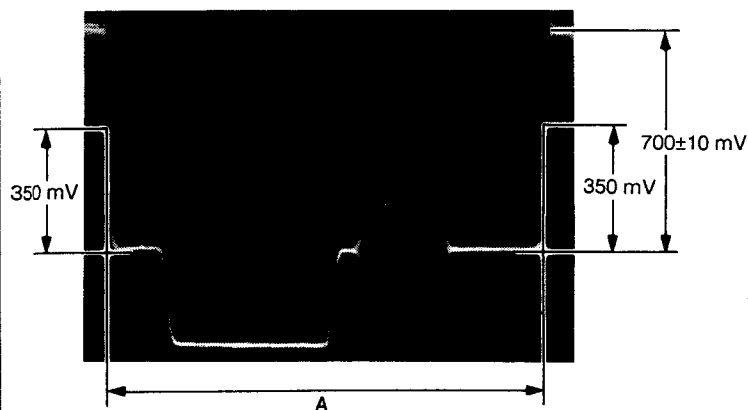


● S1 (H BLKG SELECT)



2. Adj. point: ● S1 (H BLKG SELECT)
/SG-143P board

Spec. : $A = 12.05 \pm 0.25 \mu s$

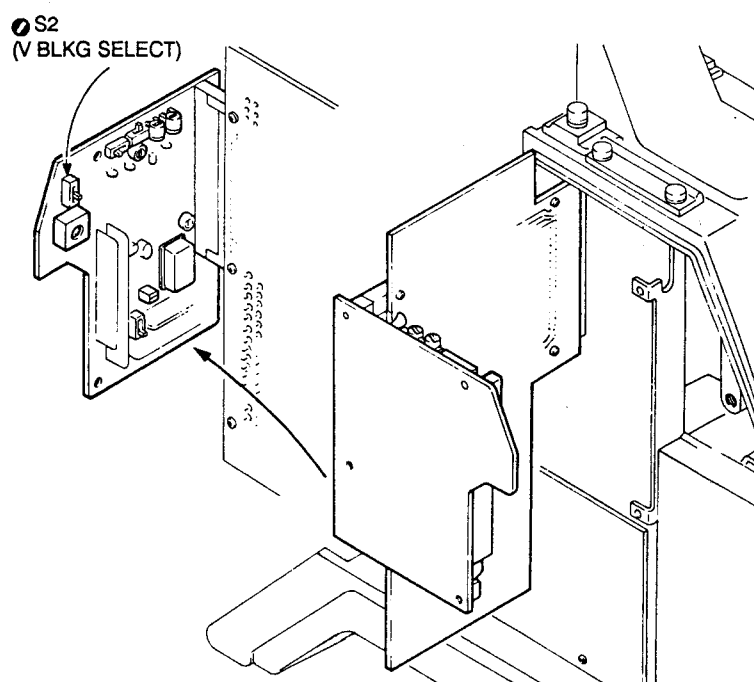


Step 9. V BLKG Width Adjustment

■ Adjustment procedures

Adj. point: S2 (V BLKG SELECT)/SG-143P board

Adjust : The V BLKG width can be selected to 23H, 24H and 25H, respectively, by S2/SG-143P board.
Usually, set to 24H (center position).



Step 10. INT SC Phase Adjustment

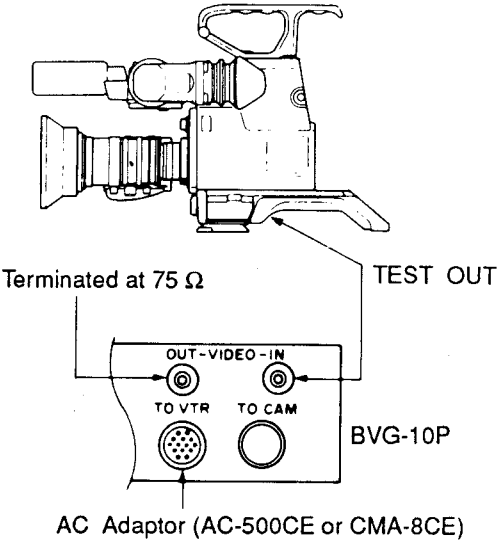
■ Setting

Equipment:	CF Pulse Generator Vectorscope 1751	To be extended:	SG-143P board
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■ Adjustment procedures

When using the CF Pulse Generator, adjust as follows.

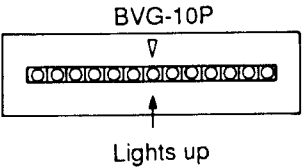
Connection:



Preparation: Selector of BVG-10P

→SOURCE CHECK

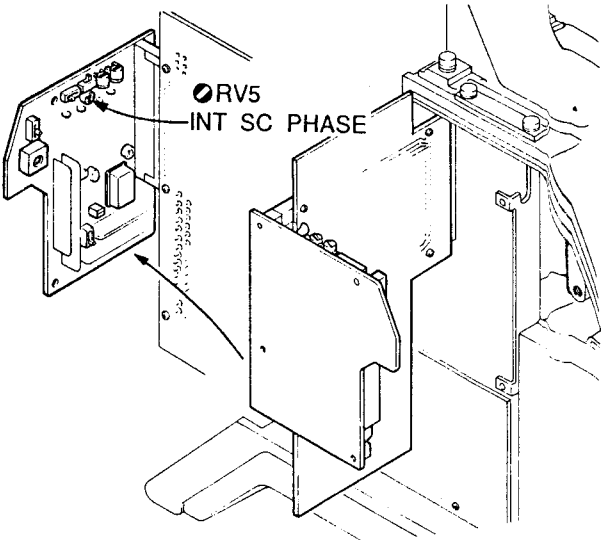
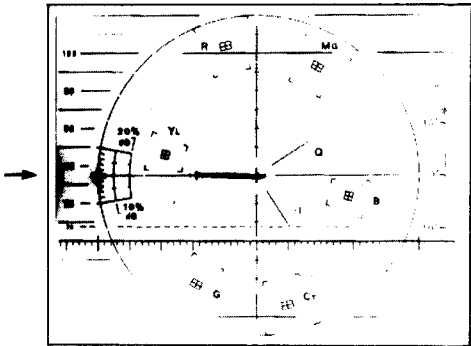
Adjustment: Adjust RV5 (INT SC PHASE)/SG-143P board so that the LED lamp of BVG-10P lights at center.



When using the Vectorscope, adjust as follows.

Connection: Connect the TEST OUT terminal of the camera to vectorscope, and set it to SCH mode.

Adjustment: Adjust RV5 so that the luminous line of the burst (SC) meets the luminescent spot of H properly.



Step 11. Pre DC Balance Adjustment

- Setting

Equipment : Digital Voltmeter	Earthing point : GND terminal/extension board
To be extended : VA-121 board	

- Preparation

Lens iris Close "C"

S2 → **TEST** / VA-121 board → "OFF"

● RV6 **G GAIN** /VA-121 board → Mechanical center

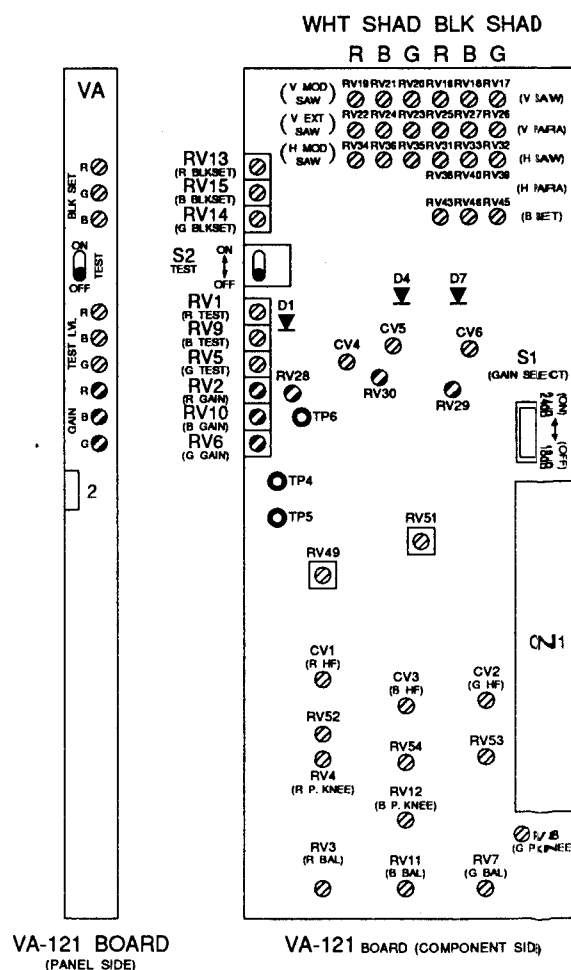
RV2 R GAIN / VA-121 board → Mechanical center

● RV10 B GAIN / VA-121 board → Mechanical center

- Adjustment procedures

Adjust every chanel as shown below.

	Test point/ VA-121 board	Adj. point/ VA-121 board	Specification
G-ch	the cathode of D4 or TP5	⦿ RV29	+1.1±0.1 Vdc
B-ch	the cathode of D7 or TP6	⦿ RV30	+1.4±0.1 Vdc
R-ch	the cathode of D1 or TP4	⦿ RV28	+1.1±0.1 Vdc



- **Note**

After this adjustment is completed, be sure to carry out step 13. VA Gain Adjustment.

Step 12. R/B Black Offset Adjustment

■ Setting

Equipment : Oscilloscope
To be extended : VA-121 board

Trigger : TP25/extension board

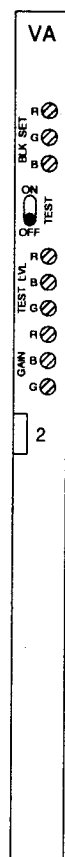
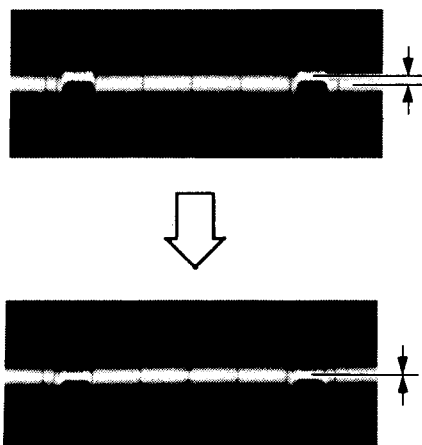
■ Preparation

OUTPUT/DCC Switch (side panel) → "CAM/DCC OFF"
S2 **TEST** VA-121 board → "OFF"

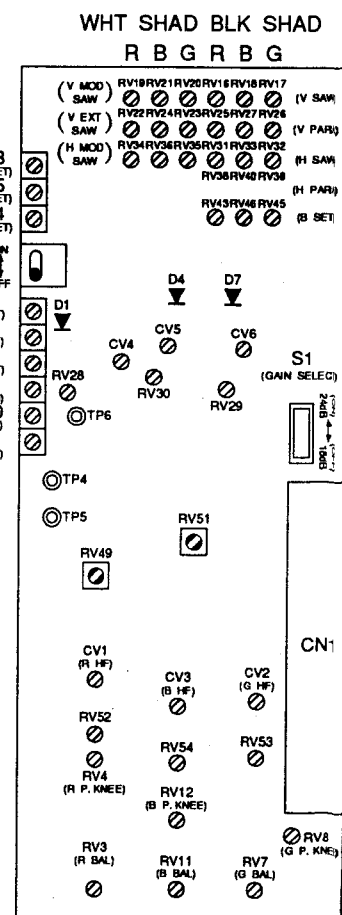
■ Adjustment procedures

Adjust every channel as shown below.

	Test Point/VA-121 board	Adj. point/VA-121 board
R-ch	Emitter of Q11	RV49
B-ch	Emitter of Q32	RV51



VA-121 BOARD
(PANEL SIDE)



VA-121 BOARD (COMPONENT SIDE)

Step 13. VA Gain Adjustment

■ Note

- Be sure to complete step 11. Pre DC Balance Adjustment, or this adjustment will become invalid.
- Use a white pattern chart for this adjustment. Adjust the lighting so that the white area is exactly 3200°K of color temperature.
- When the pattern box is used, well maintained pattern box should be used.

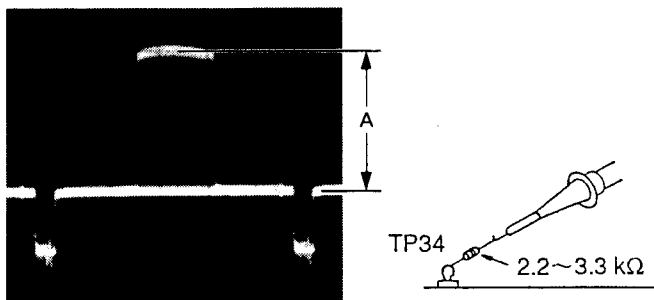
■ Setting

Equipment : Oscilloscope	Trigger : HD (TP25/extension board)
Object : White window chart	To be extended : VA-121 board

■ Adjustment procedures

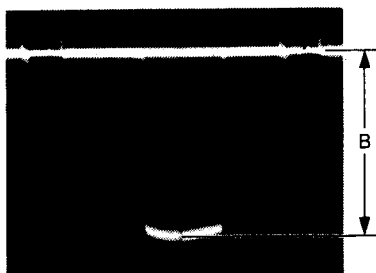
1. Adjust the zoom control and shoot the white window chart as shown right.
GAIN switch (side panel) → "0"
2. Test point: TP34 (GND:TP33)/extension board
When measuring TP34, place the resistance of 2.2 kΩ~3.3 kΩ between the probes of Oscilloscope.
Adj. point : Lens iris
Spec. : A = 0.130 ± 0.02 Vp-p
the probes of Oscilloscope.

Note: When measuring the TP34, connect the resistance (2.2~3.3 kΩ) between the probe and the TP34.

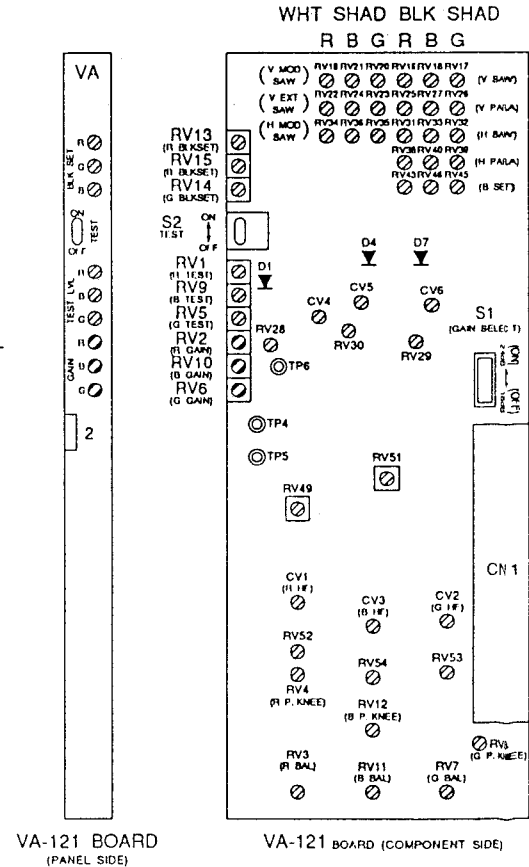
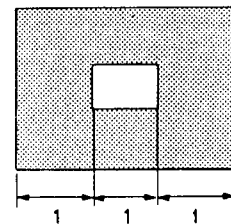


3. Adjust every channel as shown below.

	Test point/ extension board	Adj. point/ VA-121 board	Specification
G-ch	TP9	RV6	B = 0.5 ± 0.01 Vp-p
B-ch	TP5	RV10	B = 0.5 ± 0.01 Vp-p
R-ch	TP7	RV2	B = 0.5 ± 0.01 Vp-p



Monitor screen



■ Note

After this adjustment is completed, be sure to carry out step 14. DC Balance Adjustment.

Step 14. DC Balance Adjustment

■ Setting

Equipment : Digital Voltmeter	Earthing point : GND terminal/extension board
To be extended : VA-121 board	

■ Preparation

Lens iris Close "C"

S2 → **TEST** / VA-121 board → "OFF"

● RV6 **G GAIN** / VA-121 board → Mechanical center

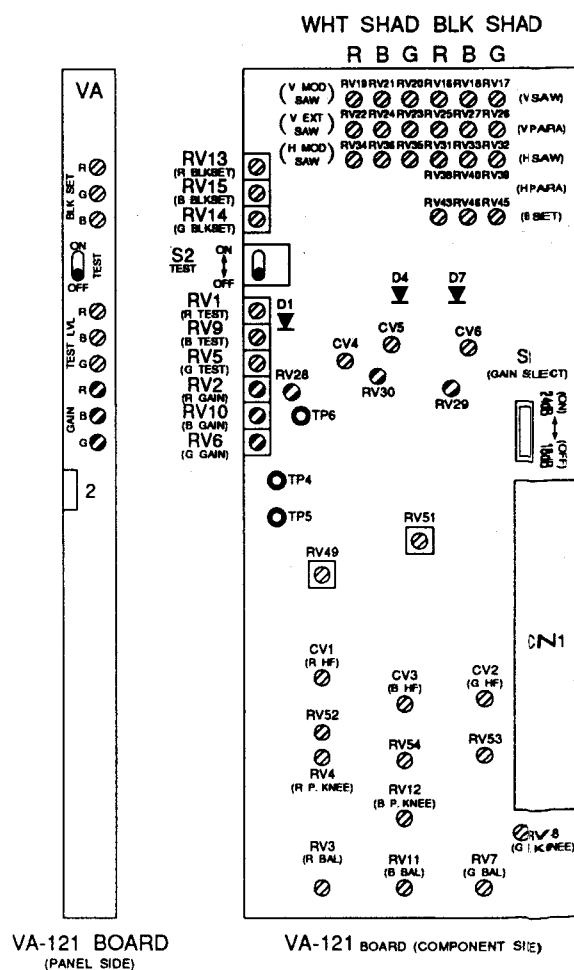
● RV2 **R GAIN** / VA-121 board → Mechanical center

● RV10 **B GAIN** / VA-121 board → Mechanical center

■ Adjustment procedures

Adjust every channel as shown below.

	Test point/ VA-121 board	Adj. point/ VA-121 board	Specification
G-ch	the cathode of D4 or TP5	● RV29	$+1.1 \pm 0.1$ Vdc
B-ch	the cathode of D7 or TP6	● RV30	$+1.1 \pm 0.1$ Vdc
R-ch	the cathode of D1 or TP4	● RV28	$+1.1 \pm 0.1$ Vdc



Step 15. Test Signal Waveform Adjustment

■ Note

Be sure to complete step 13. VA Gain Adjustment will become invalid.

■ Setting

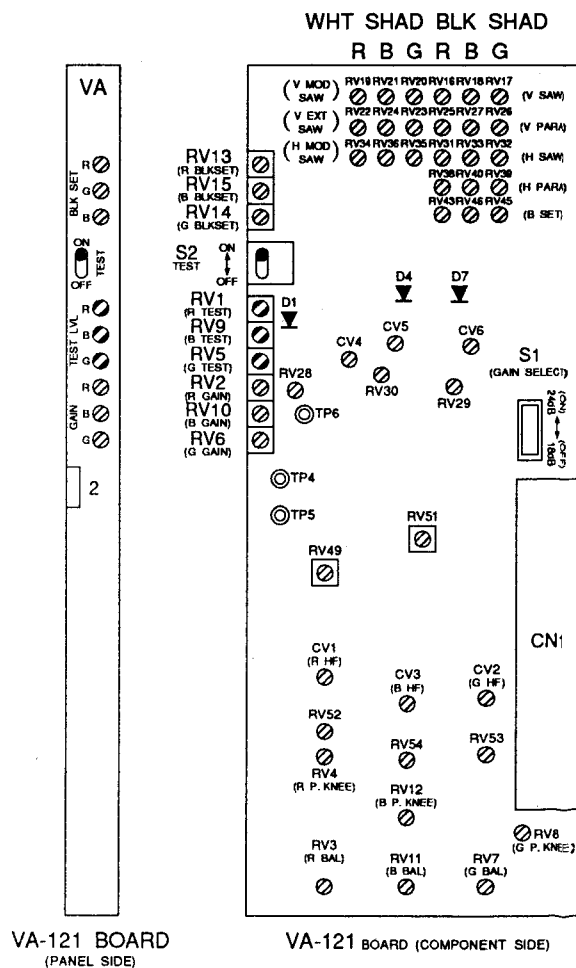
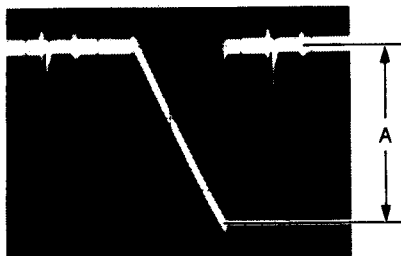
Equipment : Oscilloscope
To be extended : VA-121 board

Trigger : HD (TP25/extension board)

■ Adjustment procedures

1. S2 **TEST** /VA-121 board → "ON"
2. Adjust every channel as shown below.

	Test point/ extension board	Adj. point/ VA-121 board	Specification
G-ch	TP9	RV5	$A = 0.5 \pm 0.01$ Vp-p
B-ch	TP5	RV9	$A = 0.5 \pm 0.01$ Vp-p
R-ch	TP7	RV1	$A = 0.5 \pm 0.01$ Vp-p



■ Note

After this adjustment is completed, set S2 **TEST** /VA-121 board at "OFF".

Step 17. Modulator Balance Adjustment

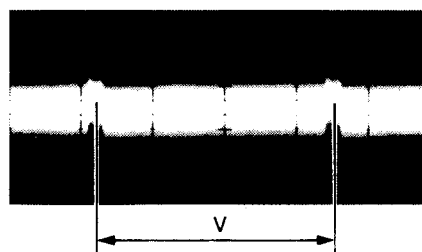
■ Setting

Equipment : Oscilloscope	To be extended : VA-121 board
Lens iris : Close "C"	Trigger : VD(TP26/extension board)

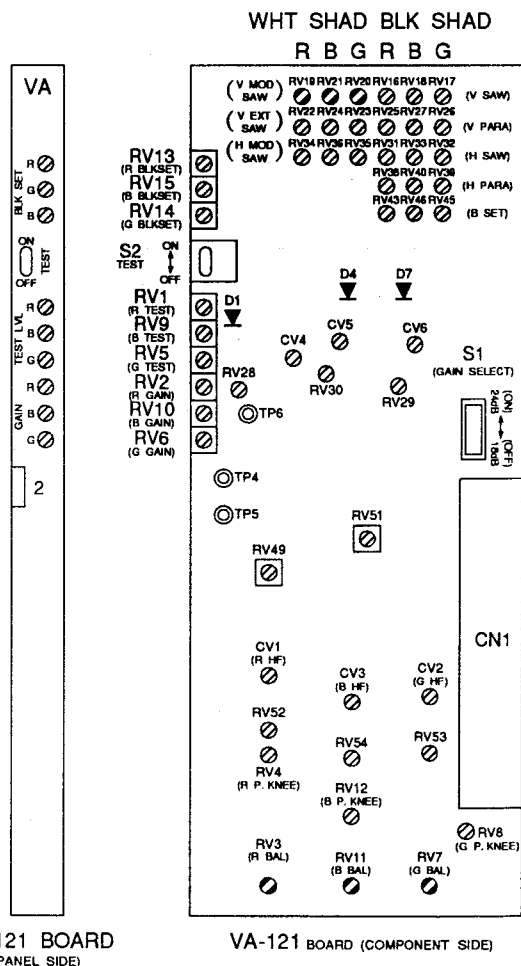
■ Adjustment procedures

Adjust every channel as shown below.

	Test point/ extension board	Adj. point/ VA-121 board	Specification
G-ch	TP9	RV7	The waveform does not change even if RV20 /VA-121 board is turned both clockwise and counterclockwise.
B-ch	TP5	RV11	The waveform does not change even if RV21 /VA-121 board is turned both clockwise and counterclockwise.
R-ch	TP7	RV3	The waveform does not change even if RV19 /VA-121 board is turned both clockwise and counterclockwise.



Not to be changed



■ Note

After this adjustment is completed, be sure to carry out step 19. White Shading Adjustment.

1. ALIGNMENT

1. ALIGNMENT

1. ALIGNMENT

1. ALIGNMENT

- #### 1. ALIGNMENT

1. ALIGNMENT

1. ALIGNMENT

1. ALIGNMENT



1. ALIGNMENT

1. ALIGNMENT

1. ALIGNMENT

1. ALIGNMENT

Step 19. White Shading Adjustment

■ Note

- Be sure to complete step 17. Modulator Balance Adjustment, or this adjustment will affect the black shading adjustment.
- When using the lens with the EXTENDER attached, carry out the V EXT SAW adjustment. Before this adjustment, set the EXT lever of lens at X2 position and adjust the iris control so that the video level at TEST OUT terminal is 700 ± 10 mV. After this adjustment is completed, set the EXT lever at X1 position.

■ Setting

Equipment : Waveform monitor (WFM)
Object : White window chart

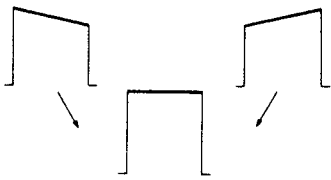
To be extended : VA-121 board

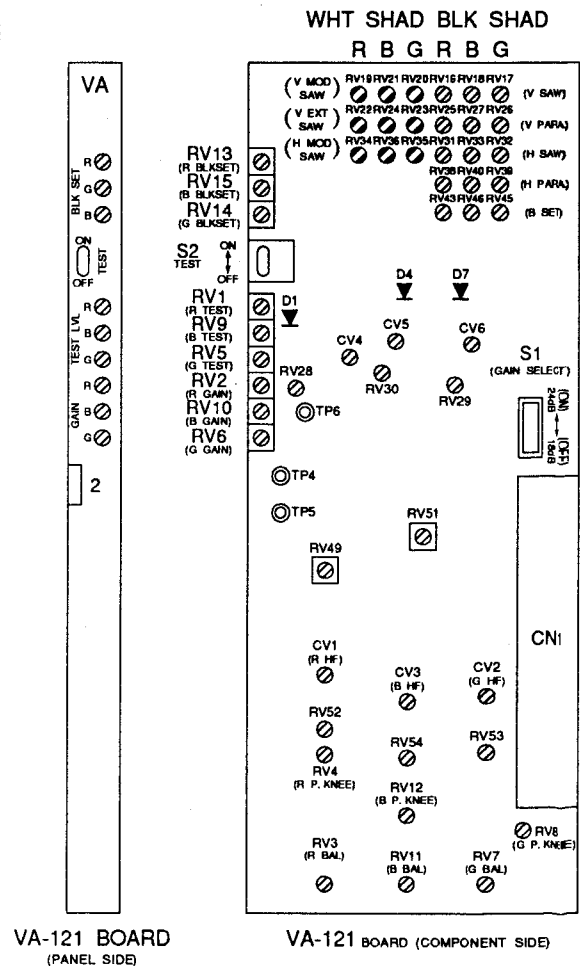
■ Preparation

- ENC/RGB switch (side panel) → "RGB"
S4 (WHT CLIP) /PR-138E board → "OFF"
- Set the zoom control at TELE and shoot the white area of white window chart.
- Adjust the iris control so that the video level at the TEST OUT terminal is 700 ± 10 mV.

■ Adjustment procedures

Adjust every channel as shown below.

	Switches Setting (side panel)	Adjusting Point/VA-121 board		
		H MOD SAW	V MOD SAW	V EXT SAW
G	G/OFF → G R/OFF/B → OFF	RV35	RV20	RV23
R	G/OFF → OFF R/OFF/B → R	RV34	RV19	RV22
B	G/OFF → OFF R/OFF/B → B	RV36	RV21	RV24
TEST OUT terminal				



Note: After this adjustment is completed, set the S4 (WHT CLIP)/PR-138E board at "ON".

Step 20. PR IN Gain Adjustment

■ Note

Be sure to complete step 15. Test Signal Waveform Adjustment, or this adjustment will become invalid.

■ Setting

Equipment : Oscilloscope
To be extended : PR-138E board

Trigger : CP (TP35/extension board)

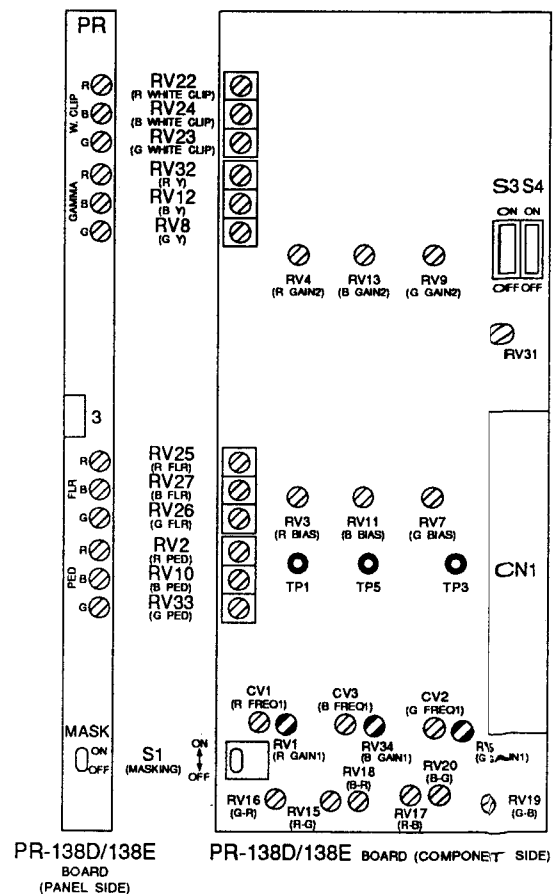
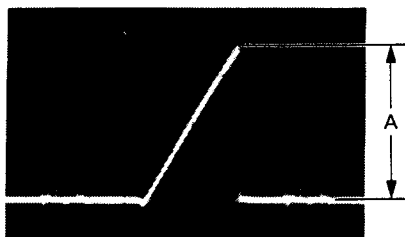
■ Preparation

S2 **TEST** /VA-121 board → "ON"
OUTPUT/DCC Switch (Side Panel) → "CAM/OFF"
GAIN Switch (Side Panel) → "0"

■ Adjustment procedures

Adjust every channel as shown below.

	Test point/ PR-138E board	Adj. point/ PR-138E board	Specification
G-ch	TP3	RV5	$A = 2.0 \pm 0.1 \text{ Vp-p}$
B-ch	TP5	RV34	$A = 2.0 \pm 0.1 \text{ Vp-p}$
R-ch	TP1	RV1	$A = 2.0 \pm 0.1 \text{ Vp-p}$



■ Note

After this adjustment is completed, set the S2 **TEST** /VA-121 board to "OFF".

Step 21. Flare DC Balance Adjustment

■ Setting

Equipment : Oscilloscope	Trigger : CP (TP35/extension board)
To be extended : PR-138E board	

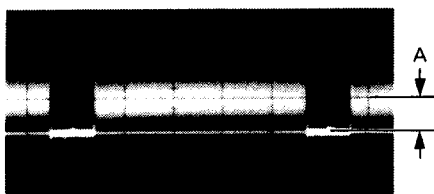
■ Preparation

Lens iris	→ Close "C"
S2 TEST /VA-121 board	→ "OFF"
S3 ON/OFF /PR-138E	→ "ON"

■ Adjustment procedures

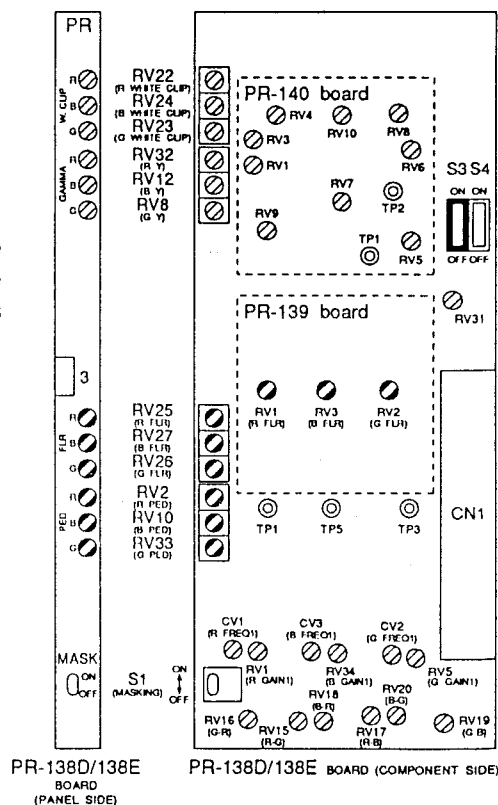
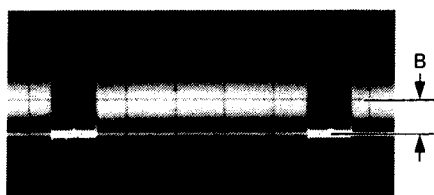
1. **RV25 (R FLR) /PR-138E board** → fully clockwise
RV26 (G FLR) /PR-138E board → fully clockwise
RV27 (B FLR) /PR-138E board → fully clockwise
2. Carry out R- channel adjustment and B-channel adjustment as shown below.

	Test point/ extension board	Adj. point/ VA-138E board	Specification
G-ch	TP17	RV33	A = 50±5 mV
B-ch	TP16	RV10	
R-ch	TP18	RV2	



3. **RV3 (R FLR) /PR-138E board** → fully counter clockwise
RV26 (G FLR) /PR-138E board → fully counter clockwise
RV21 (B FLR) /PR-138E board → fully counter clockwise
4. Carry out R-channel adjustment and B-channel adjustment as shown below.

	Test point/ extension board	Adj. point/ PR-139 board	Specification
G-ch	TP17	RV2	A = 50±5 mV
B-ch	TP16	RV3	
R-ch	TP18	RV1	



■ Note

After this adjustment is completed, set the switches as follow.

- OUTPUT/DCC switch (side panel) "CAM/OFF"
- S4 (WHT CLIP) switch/PR-138E board "ON"

Step 22. Gamma Balance Adjustment

■ Note

Be sure to complete step 15. Test Signal Waveform Adjustment, or this adjustment will become invalid.

■ Setting

Equipment : Oscilloscope
To be extended : PR-138E board

Trigger : CP (TP35/extension board)

■ Adjustment procedures

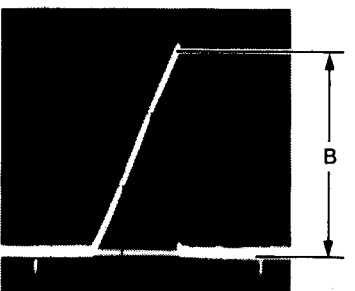
1. S2 **TEST** /VA-121 board → "ON"
S5 (WHT CLIP) /PR-138E board → "OFF"
2. Adjust every channel as shown below.

	Test point/ extension board	Adj. point/ PR-138E board	Specification
G-ch	TP17	RV7	The peak level of waveform does not change even if the S3 (γ ON/OFF)/PR-138E board is set to ON or OFF.
B-ch	TP16	RV11	
R-ch	TP18	RV3	

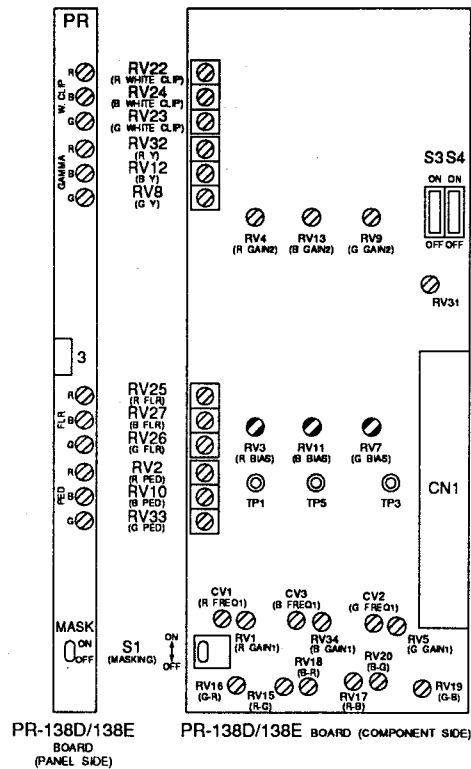
γ : ON



γ : OFF



A = B = 700 mVp-p



■ Note

After this adjustment is completed, set the switches as follows.

- S4 (WHT CLIP)/PR-138E board → "ON"
S2 **TEST** /VA-121 board → "OFF"
S3 (γ ON/OFF) /PR-138E board → "OFF"

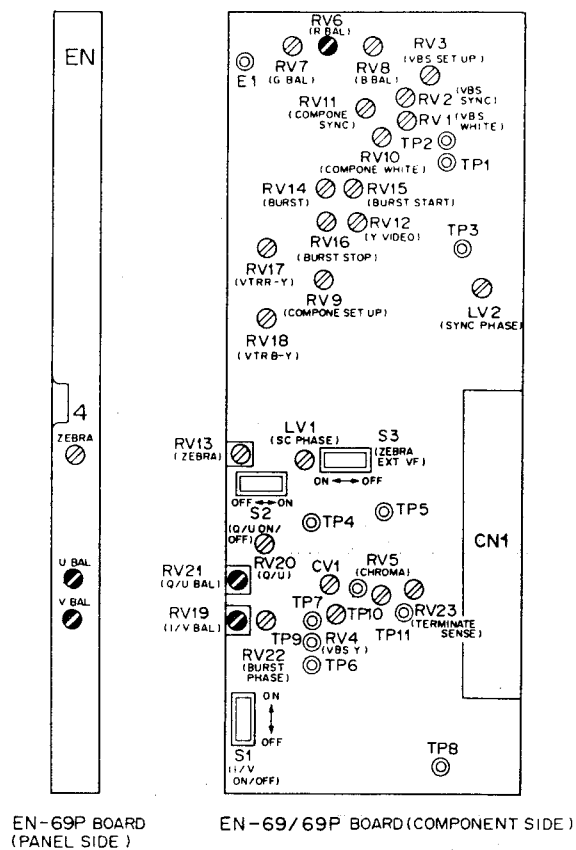
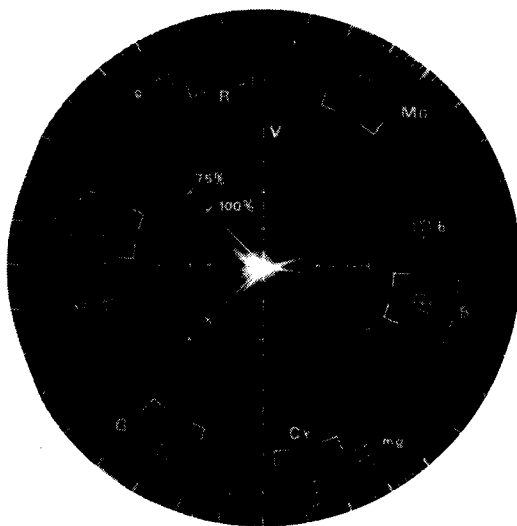
Step 23. Carrier Balance Adjustment

■ Setting

Equipment : Vectorscope (MAX Gain)

■ Adjustment procedures

1. OUTPUT/DCC switch (side panel)
→ "BARS/OFF"
ENC/RGB switch (side panel) → "ENC"
2. Adjust $\odot$ RV19 **V BAL** and $\odot$ RV21 **U BAL**
/EN-69P board so as to center the black beam
spot on the vectorscope.



EN-69P BOARD
(PANEL SIDE)

EN-69/ 69P BOARD (COMPONENT SIDE)

- Note: 1) When black spots cannot be discriminated due to several beam spots, turn the $\odot$ RV6/ EN-69P board. The black beam spots cannot be shifted. In this case, after adjustment is completed, perform step 29. Color Bar Adjustment.
- 2) After the adjustment is completed, set the OUTPUT/DCC switch (side panel) to "CAM/OFF"

Step 24. Black Set Pedestal Adjustment

■ **Note**

Be sure to reset the compensation data in the microprocessor, or this adjustment will become invalid.
(See 4-1-3. Precautions on Adjustments)

- **Setting**

Equipment : Waveform monitor, Vectorscope (MAX Gain)

To be extended : VA-121 board

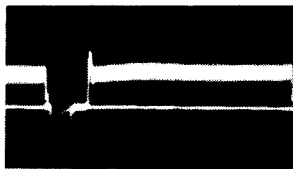
■ Preparation

1. Lens iris → Close "C"
 OUTPUT/DCC switch (side panel) → "CAM/OFF"
 ENC/RGB switch (side panel) → "RGB"
 G/OFF switch (side panel) → "G"

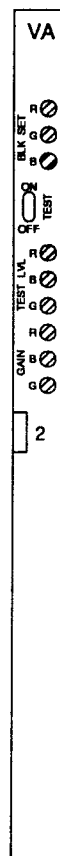
2. Adjust the PEDESTAL control (side panel) so that the pedestal level is approx. 70 mV.

- Adjustment procedures

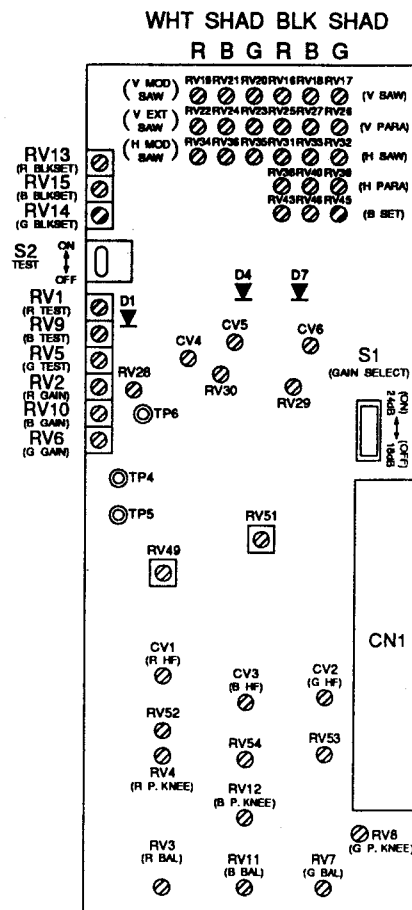
1. Test Point : TEST OUT terminal
Adj. point :  RV14 (G BLK SET) /VA-121 board
Spec. : The pedestal level does not change even if the GAIN selector is set to "0" or "9".



↑ Not to be changed



VA-121 BOARD
(PANEL SIDE)

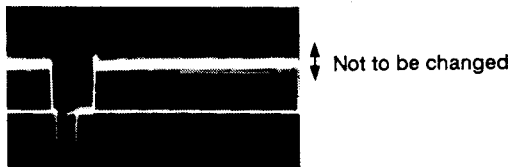


VA-121 BOARD (COMPONENT SIDE)



(Proceed to next page.)

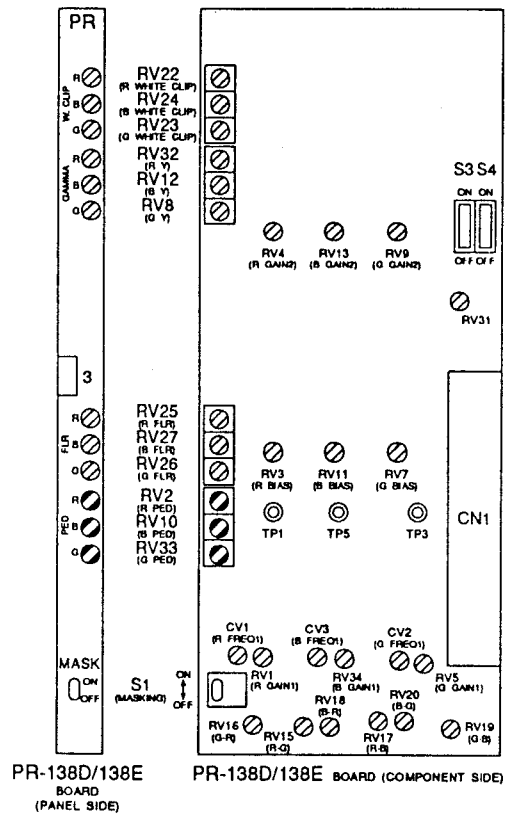
2. Test point : TEST OUT terminal
 Adj. point : ● RV45 /VA-121 board
 Spec. : The pedestal level does not change
 even if the GAIN selector is set to
 "0" or "18".



3. ■ To be extended: PR-138E board
 ■ PEDESTAL control (side panel)
 → Mechanical center
 ■ GAIN selector (side panel) → "0"
 4. Test point : TEST OUT terminal
 Adj. point : ● RV33/PR-138E board
 Spec. : $A = 20 \pm 5 \text{ mV}$



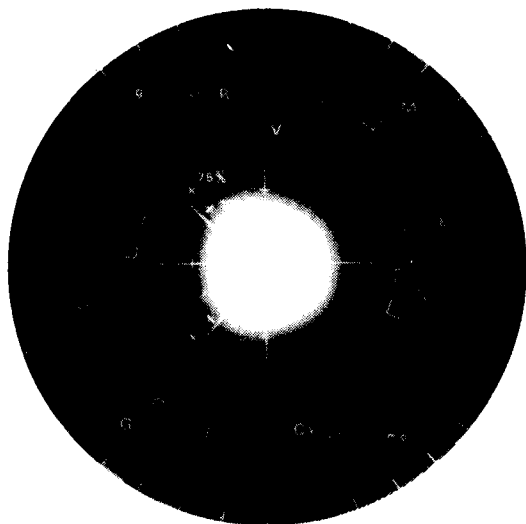
5. ENC/RGB switch (side panel) → "ENC"



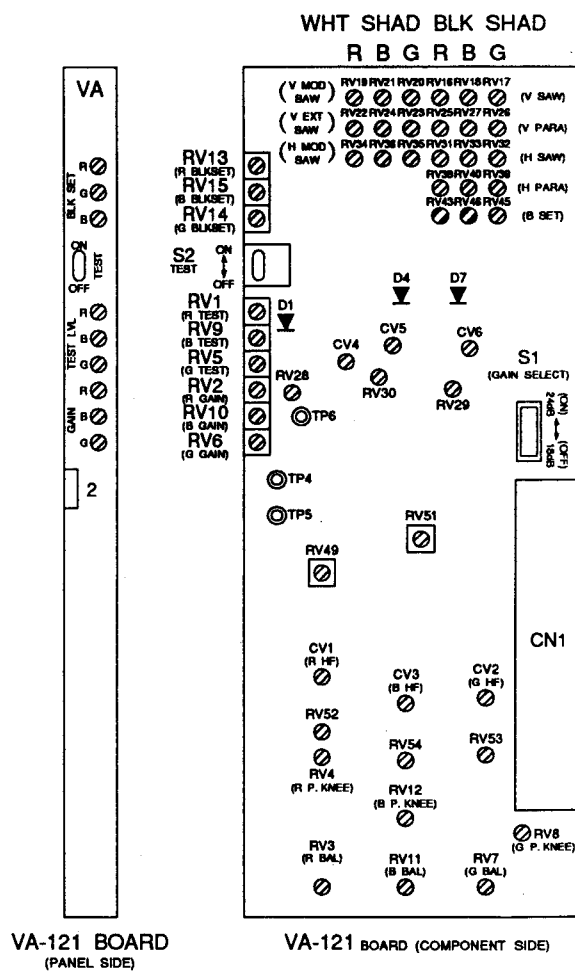
(Proceed to next page)

- 4-31

10. Test point : TEST OUT terminal
 Adj. point : ● RV43, ● RV46/VA-121 board
 Spec. : The beam spot should be positioned in the center of the vectorscope screen.



11. Repeat item 6 to 10 so as to center the beam spot on the vectorscope, even if the GAIN selector (side panel) is set to "0", "9" or "18".



■ Note

After this adjustment is completed, set the GAIN selector (side panel) to "0".

Step 25. Flare Adjustment

■ Note

Repeat carrying out this adjustment after step 24. Black Set · Pedestal Adjustment is carried out three or four times.

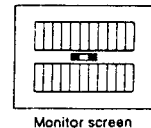
■ Setting

Object : Grayscale chart

Equipment : Waveform monitor

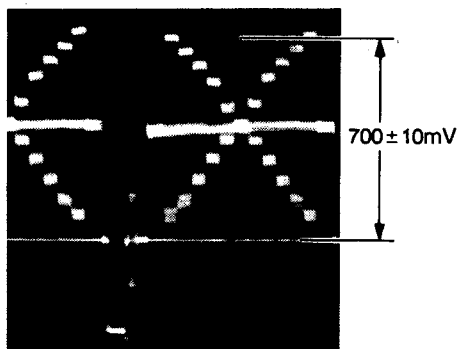
■ Preparation

1. ENC/RGB switch (side panel) → "ENC"
 ●RV26 [G FLR] /PR-138E board → fully counterclockwise ↺
2. As shown right, stick non-reflective and non-photo conductive cloth (Such as velvet) as a reference of the black level.

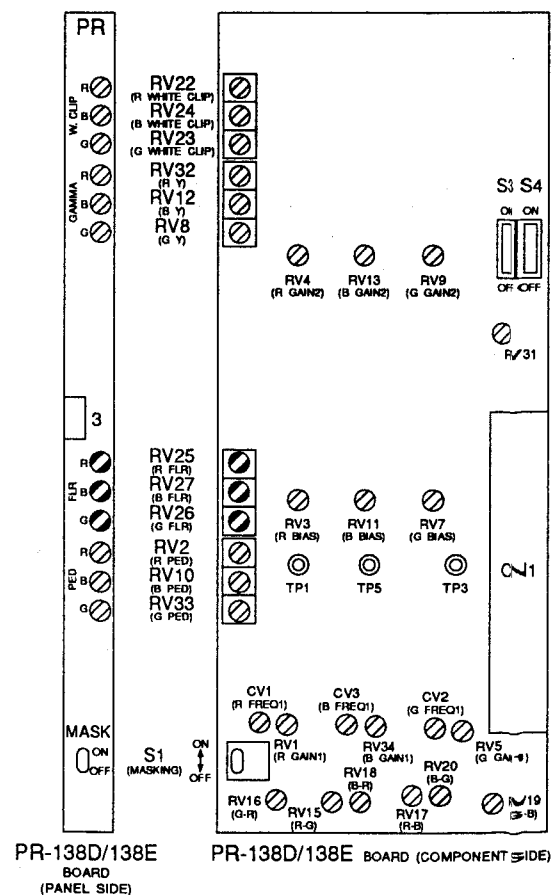
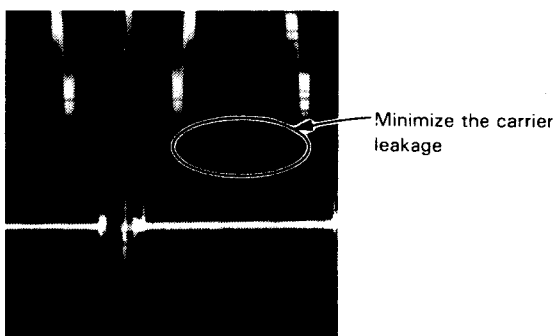


■ Adjustment procedures

1. Adjust the zoom control so that the grayscale chart frame touches the underscanned picture frame on the monitor screen.
2. Test point : TEST OUT terminal
 Adj. point : Lens iris
 Spec. : $700 \pm 10 \text{ mV}$



3. Open the iris control 1 more stop than F value of item 2.
4. Test point : TEST OUT terminal
 Adj. point : ●RV25, ●RV27/PR-138E board
 Spec. : The carrier leakage of black level should be minimized.



Step 26. PR OUT Gain Adjustment

■ Note

Be sure to complete step 22. Gamma Balance Adjustment, or this adjustment will become invalid.

■ Setting

Equipment : Oscilloscope, Waveform monitor
To be extended : PR-138E board

Trigger: CP(TP35/extension board)

■ Preparation

S2 **TEST** /VA-121 board → "ON"

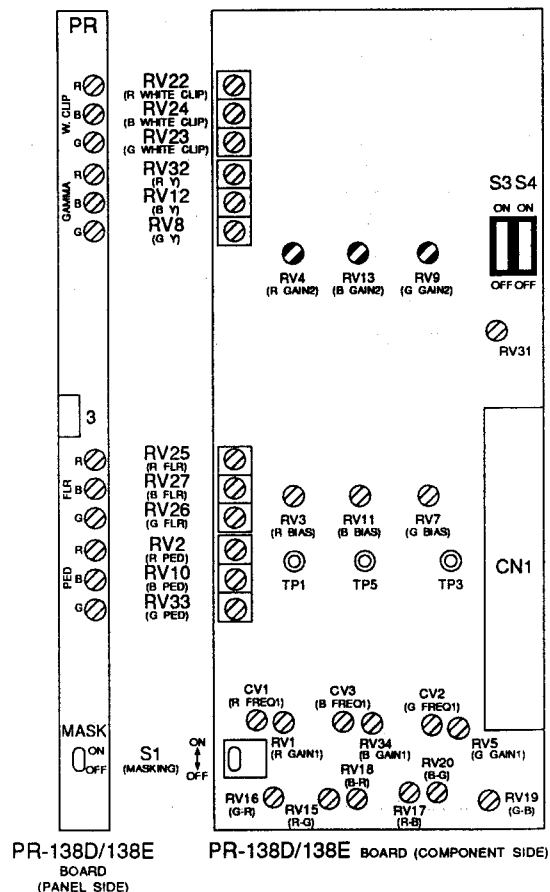
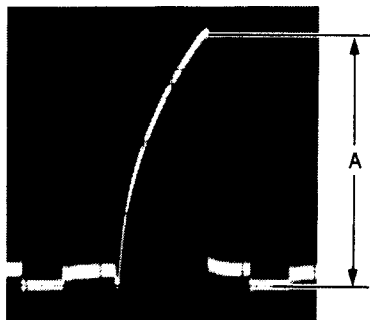
S3 (γ ON/OFF)/PR-138E board → "ON"

S4 (WHT CLIP)/PR-138E board → "OFF"

■ Adjustment procedures

Adjust every channel as shown below.

	Test point/ extension board	Adj. point/ PR-138E board	Specification
G-ch	TP17	RV9	$A = 714 \pm 7 \text{ mVp-p}$
B-ch	TP16	RV13	$A = 714 \pm 7 \text{ mVp-p}$
R-ch	TP18	RV4	$A = 714 \pm 7 \text{ mVp-p}$



■ Note

After this adjustment is completed, set the S2 **TEST** /VA-121 board to "OFF" and S4 (WHT CLIP) /PR-138E board to "ON".

Step 27. RGB Video Level Adjustment

■ Note

Be sure to complete step 26. PR OUT Gain Adjustment, or this adjustment will become invalid.

■ Setting

Equipment : Waveform monitor (WFM)

■ Preparation

ENC/RGB switch (side panel) → "RGB"
G/OFF switch (side panel) → "G"
R/OFF/B switch (side panel) → "OFF"

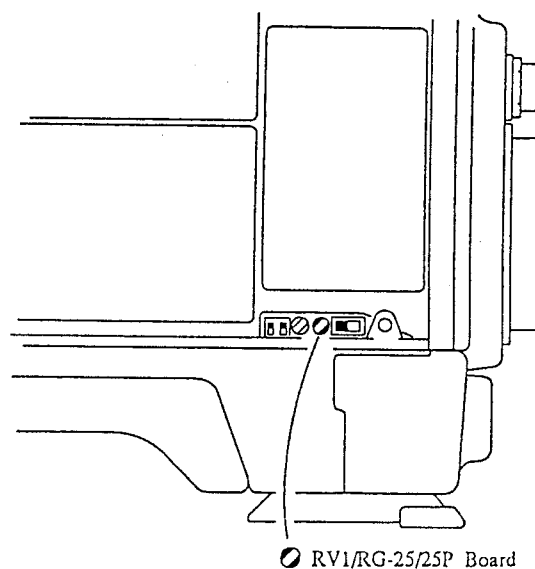
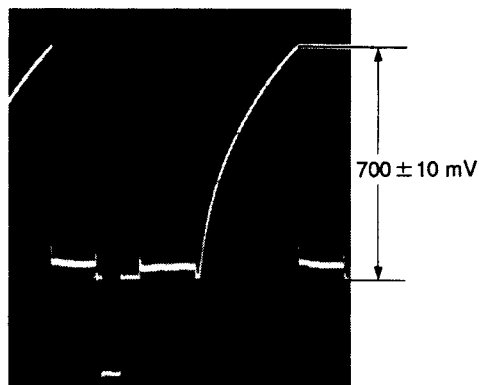
S2 **TEST** /VA-121 board → "ON"
S4 (WHT CLIP)/PR-138E board → "OFF"

■ Adjustment procedures

Test point : TEST OUT terminal

Adj. point : ○RV1/RG-25 board

Spec. : A = 700 ± 10 mV



■ Note

After this adjustment is completed, set the S2 **TEST** /VA-121 board to "OFF" and S4 (WHT CLIP) /PR-138E board to "ON".

Step 28. EN Y Level Adjustment

■ Note

Be sure to complete step 27. RGB Video Level Adjustment, or this adjustment will become invalid.

■ Setting

Equipment : Waveform monitor (WFM)

To be extended : EN-69P board

■ Preparation

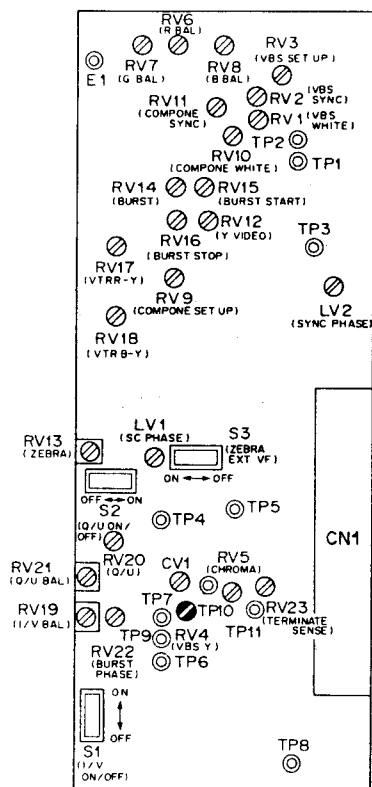
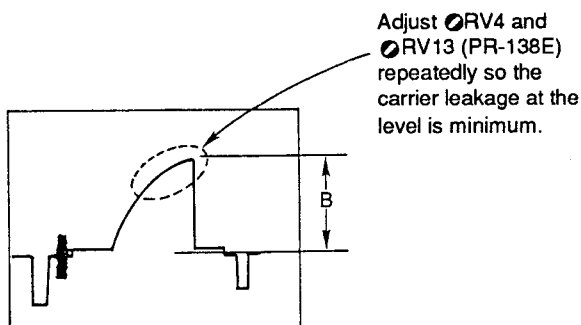
ENC/RGB switch (side panel) → "ENC"

S2 **TEST** /VA-121 board → "ON"

S4 (WHT CLIP)/PR-138E board → "OFF"

■ Adjustment procedures

1. Test point : TEST OUT terminal
Adj. point : ●RV4/EN-69P board
Spec. : $B = 700 \pm 10 \text{ mV}$



EN-69/69P BOARD (COMPONENT SIDE)

■ Note

After this adjustment is completed, set the switches as follows.

- OUTPUT/DCC switch (side panel) → "CAM/OFF"
- S2 **TEST** /VA-121 board → "OFF"
- S4 (WHT CLIP)/PR-138E board → "ON"

Step 29. Color-bar Adjustment

■ Note

Be sure to complete step 28. EN Y Level Adjustment

■ Setting

Equipment : Waveform monitor (WFM)

To be extended : EN-69P board

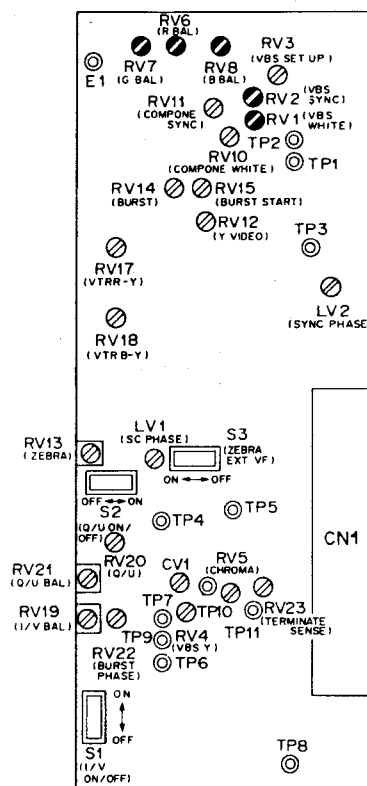
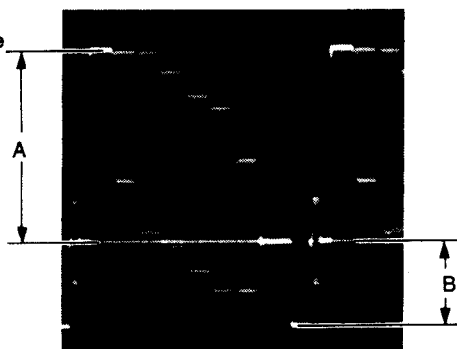
■ Preparation

- OUTPUT/DCC switch (side panel) → "BARS/OFF"
- ENC/RGB switch (side panel) → "ENC"

■ Adjustment procedures

1. Adjust ● RV7, ● RV6 and ● RV8/EN-69P board so that the white level "A" at TEST OUT terminal is 700 ± 10 mV and the carrier leakage is minimized.
2. Test pont : TEST OUT terminal
Adjust : B = 300 ± 10 mV; ● RV2/EN-69P board

Minimize the carrier leakage



EN-69/69P BOARD (COMPONENT SIDE)

■ Note

After this adjustment is completed, set the OUTPUT/DCC switch (side panel) at "CAM/OFF".

Step 30. U.V. Gain Adjustment

■ Setting

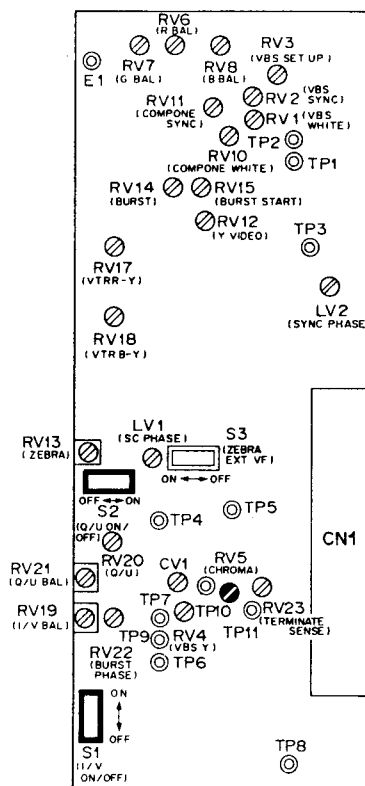
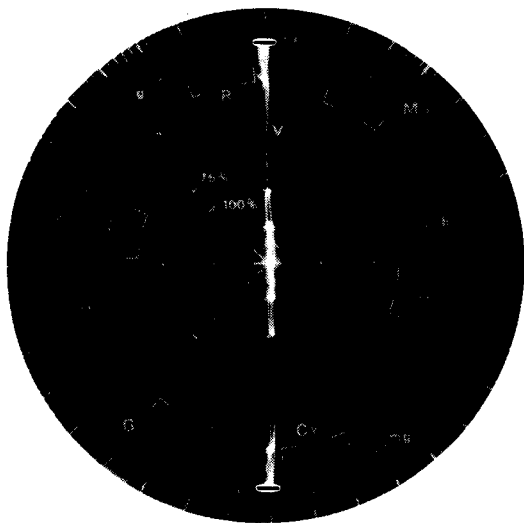
Equipment : Vectorscope	To be extended : EN-69P board
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■ Preparation

1. OUTPUT/DCC switch (side panel) → "BARS/OFF"
S1(V)/EN-69P board → "ON"
S2(U)/EN-69P board → "OFF"
2. Adjust the PHASE control of the vectorscope so that the V signal is overlapped with V axis on the vectorscope screen.

■ Adjustment procedures

1. Test point : TEST OUT terminal
Adj. point : ● RV5/EN-69P board
Spec. : The beam spots at both ends of the V signal should be overlapped with the scale of the vectorscope screen.



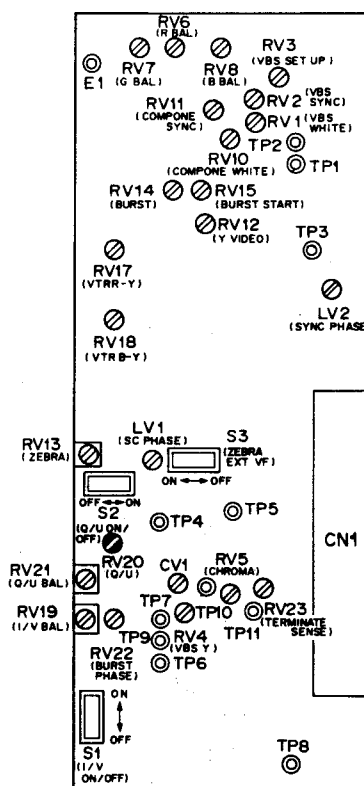
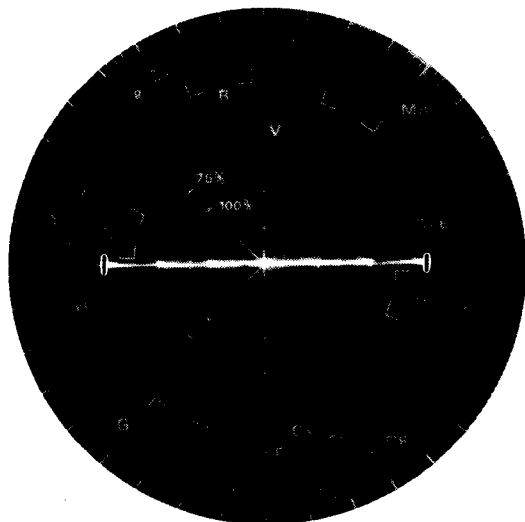
EN-69/69P BOARD (COMPONENT SIDE)

2. S1 (V)/EN-69P board → "OFF"
S2 (U)/EN-69P board → "ON"
3. Adjust the PHASE control of the vectorscope so that the U signal is overlapped with the U axis on the vectorscope screen.



(Proceed to next page)

4. Test point : TEST OUT terminal
 Adj. point : ● RV20/EN-69P board
 Spec. : The beam spots at both ends of the U signal should be overlapped with the scale of the vectorscope screen.



EN-69/69P BOARD (COMPONENT SIDE)

■ Note

After this adjustment is completed, set the switches as follows:

- OUTPUT/DCC switch (side panel) → "CAM/OFF"
- S1 (V)/EN-69P board → "ON"
- S2 (U)/EN-69P board → "ON"

Step 31. Burst Adjustment

■ Setting

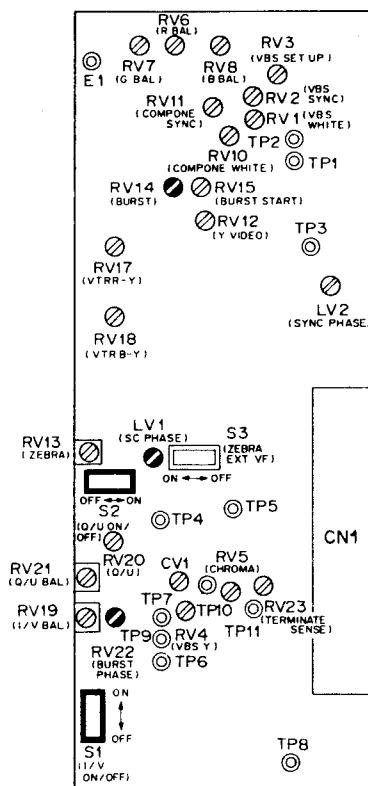
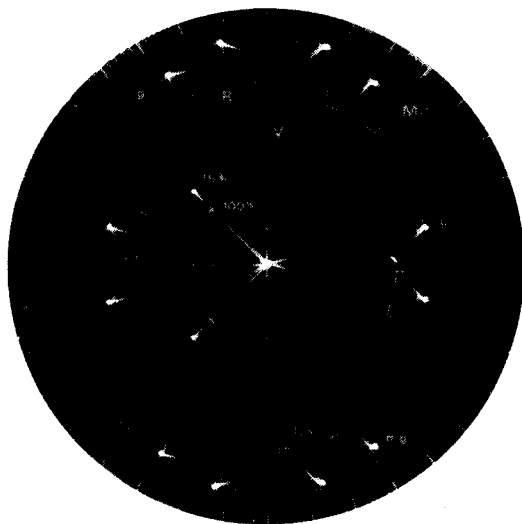
Equipment : Vectorscope	To be extended : EN-69P board
-------------------------	-------------------------------

■ Preparation

1. S1 (V)/EN-69P board → "ON"
S2 (U)/EN-69P board → "ON"
OUTPUT/DCC switch (side panel) → "BARS/OFF"
2. Adjust the PHASE control of the vectorscope so that the burst spot is overlapped with 75% scale on the vectroscope screen.

■ Adjustment procedures

1. Test point : TEST OUT terminal
Adjust : Adjust the PHASE control of the vectroscope, **RV14** (BURST), **RV22** (BURST PHASE) and **LV1** (SC PHASE)/EN-69P board so that the beam spot of the burst signal is overlapped with the 75% scale on the vectroscope.



EN-69/69P BOARD (COMPONENT SIDE)

■ Note

After this adjustment is completed, set the OUTPUT/DCC switch (side panel) at "CAM/OFF".

Step 32. VTR Y Adjustment

■ Note

Be sure to connect the CA-50P/3AP camera adaptor with the BVP-7AP camera.

■ Setting

Equipment : Oscilloscope, Waveform monitor
To be extended : EN-69P board

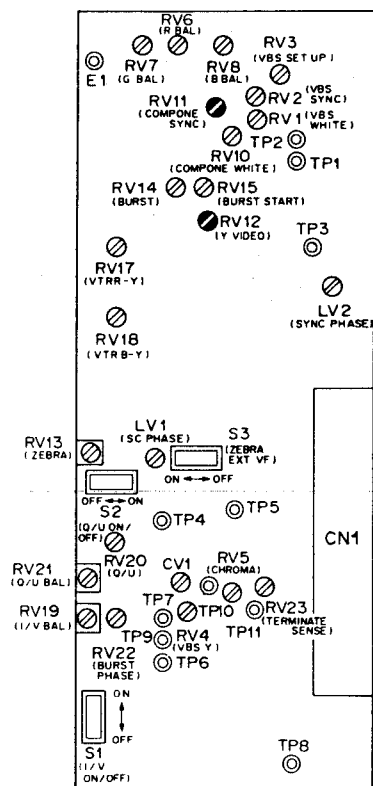
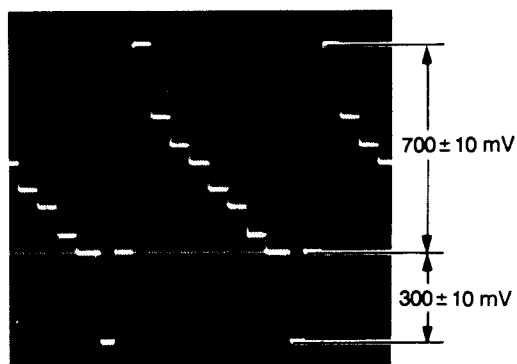
Trigger : HD (TP34/extension board)

■ Preparation

OUTPUT/DCC switch (side panel) → "BARS/OFF"

■ Adjustment procedures

1. Adjust $\odot$ RV12 (Y VIDEO)/EN-69P board so that the white level is 700 ± 10 mV.
2. Adjust $\odot$ RV11 (COMPONE SYNC)/EN-69P board so that the sync level is 300 ± 10 mV.



EN-69/69P BOARD (COMPONENT SIDE)

■ Note

After this adjustment is completed, set the OUTPUT/DCC switch (side panel) at "CAM/OFF".

Step 33. VTR R-Y Gain Adjustment

■ Note

Be sure to connect the CA-50P/3AP camera adaptor with the BVP-7AP camera.

■ Setting

Equipment : Oscilloscope
To be extended : EN-69P board

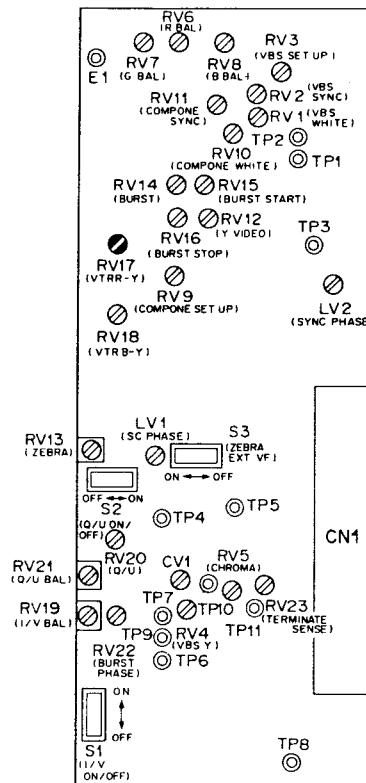
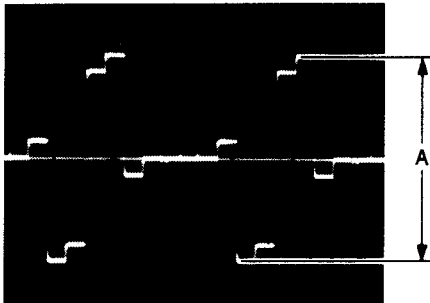
Trigger : HD (TP34/extension board)

■ Preparation

OUTPUT/DCC switch (side panel) → "BARS/OFF"

■ Adjustment procedures

Test point : TP19/extension board
Adj. point : ● RV17/EN-69P board
Spec. : $A = 525 \pm 5$ mVp-p



EN-69/69P BOARD (COMPONENT SIDE)

■ Note

After this adjustment is completed, set the OUTPUT/DCC switch at "CAM/OFF".

Step 34. VTR B-Y Gain Adjustment

■ Note

Be sure to connect the CA-50P/3AP camera adaptor with the BVP-7AP camera.

■ Setting

Equipment : Oscilloscope
To be extended : EN-69P board

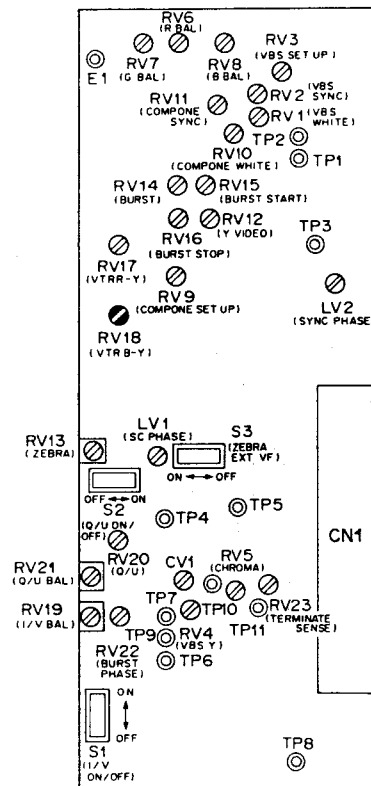
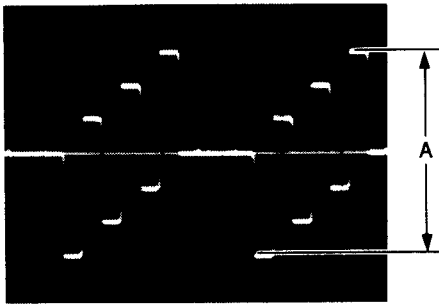
Trigger : HD (TP34/extension board)

■ Preparation

OUTPUT/DCC switch (side panel) → "BARS/OFF"

■ Adjustment procedures

Test point : TP18/extension board
Adj. point : ● RV18/EN-69P board
Spec. : $A = 525 \pm 5$ mVp-p



EN-69/69P BOARD (COMPONENT SIDE)

■ Note

After this adjustment is completed, set the OUTPUT/DCC switch (side panel) at "CAM/OFF".

Step 35. Zebra Level Adjustment

■ Setting

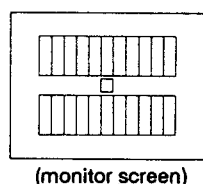
Object : Grayscale chart	To be extended : EN-69P board
Equipment : Waveform monitor (WFM)	

■ Preparation

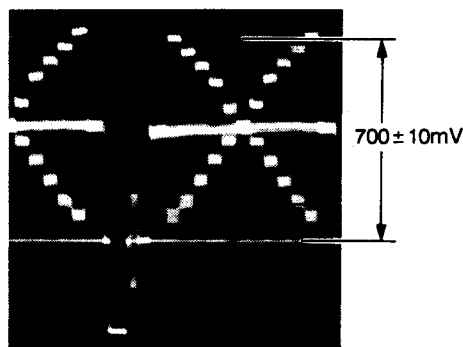
ENC/RGB switch (side panel)	→ "ENC"
TALLY/ZEBRA ON/OFF switch (viewfinder)	→ "ZEBRA"

■ Adjustment procedures

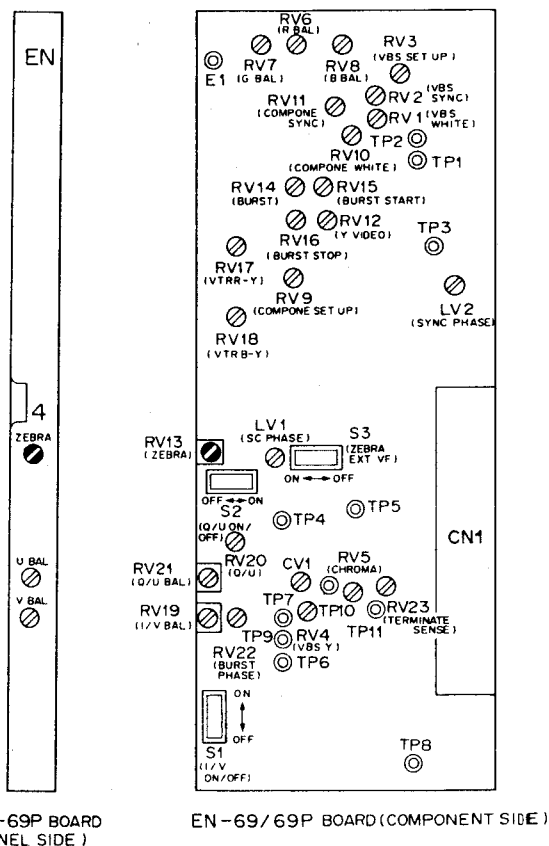
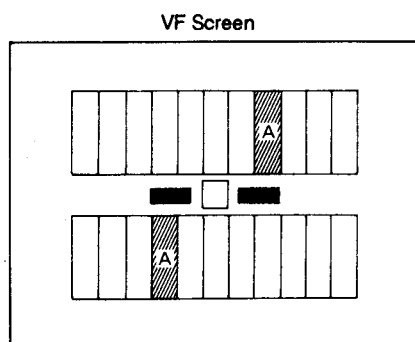
1. Adjust the zoom control so that the grayscale chart frame touches the underscanned picture frame on the monitor screen.



2. Adjust the iris control so that the white level at TEST OUT terminal is 700 ± 10 mV.



3. Adjust $\odot$ RV13(ZEBRA)/EN-69P board so that the striped pattern appears in the portion A of the VF screen as shown below.



Step 36 . Gamma Correction Adjustment

■ Note

Be sure to complete step 26. PR OUT Gain Adjustment.

■ Setting

Object : Grayscale chart
Equipment : Waveform monitor

To be extended : PR-138E board

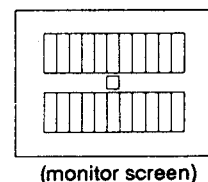
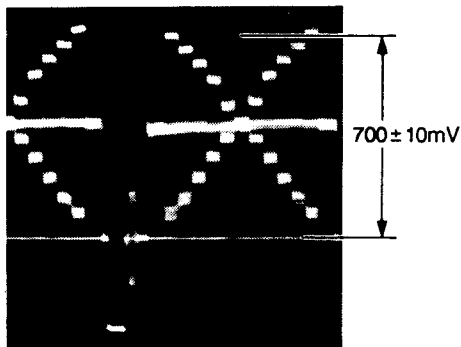
■ Preparation

ENC/RGB switch (side panel) → "RGB"
G/OFF switch (side panel) → "G"
R/OFF/B switch (side panel) → "OFF"
S4 (WHT CLIP)/PR-138E board → "OFF"

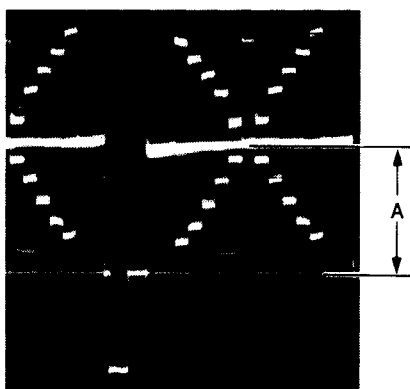
S3 (γ ON/OFF)/PR-138E board → "ON"

■ Adjustment procedures

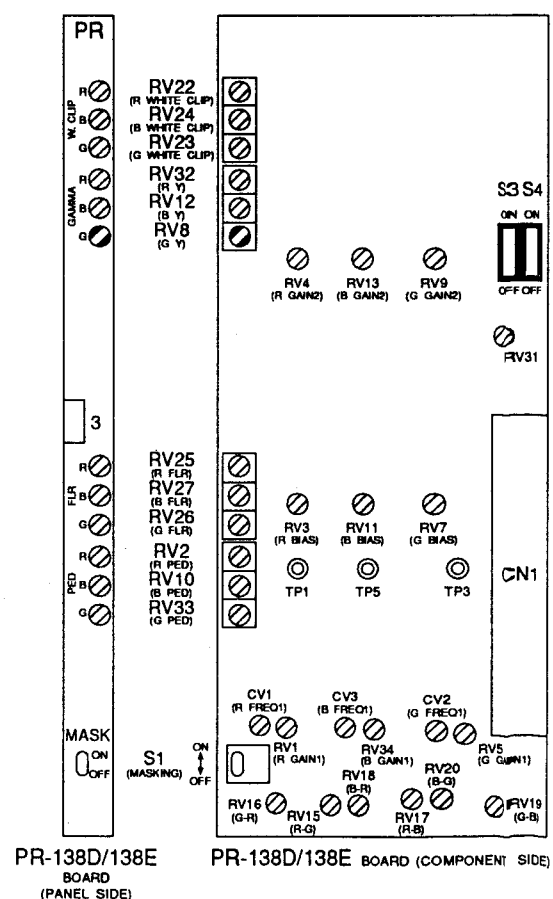
1. Adjust the zoom control so that the grayscale chart frame touches the underscanned picture frame on the monitor.
2. Adjust the iris control so that the white level at TEST OUT terminal is 700 ± 10 mV.



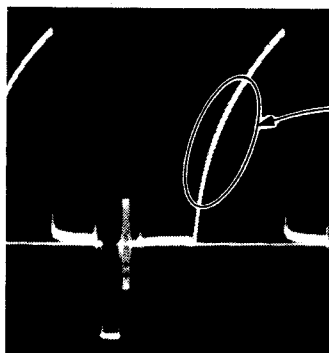
3. Test point : TEST OUT terminal
Adj. point : RV8/PR-138E board
Spec. : Cross point level "A" = 400 ± 20 mV



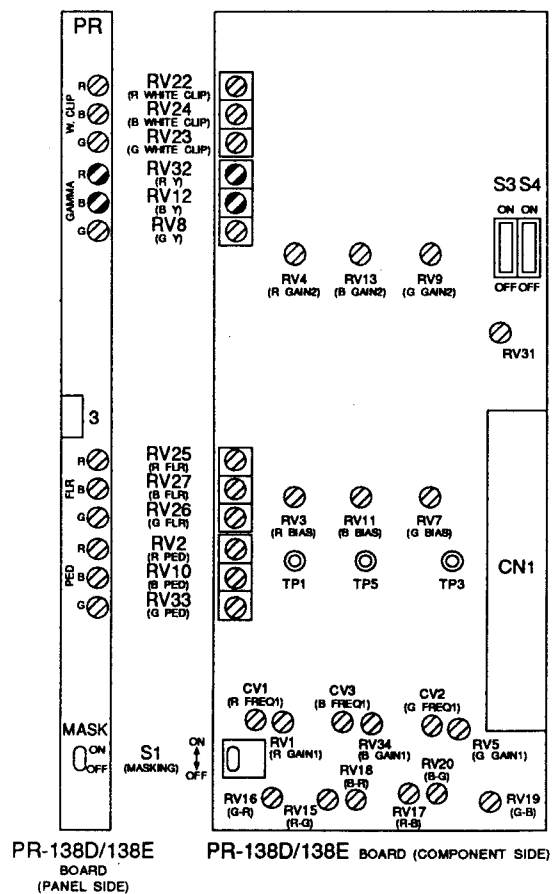
(Proceed to next page)



4. ENC/RGB switch (side panel) → "ENC"
S2 (TEST)/VA-121 board → "ON"
5. Test point : TEST OUT terminal
Adj. point : ●RV32 R GAMMA /PR-138E board
●RV12 B GAMMA /PR-138E board



Minimize the carrier leakage



■ Note

- After this adjustment is completed, set the switches as follows:
S2 TEST /VA-121 board → "OFF"
S4 (WHT CLIP) /PR-138E board → "ON"
- After this adjustment is completed, confirm that step 24. Black Set•Pedestal Adjustment is satisfied with the specification.

Step 37. Manual Knee-White Clip Adjustment

■ Note

Be sure to complete step 16. Pre Knee Adjustment.

■ Setting

Equipment : Waveform monitor (WFM)

To be extended : PR-138E board

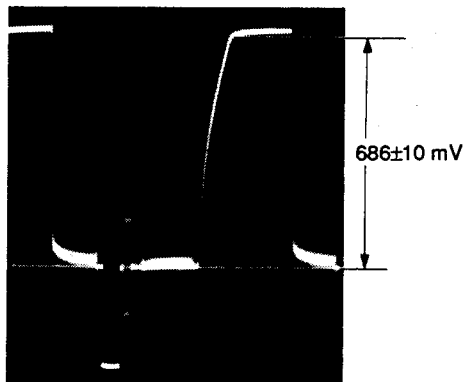
■ Preparation

GAIN switch (side panel) → "G"
 OUTPUT/DCC switch (side panel) → "CAM/OFF"
 ENC/RGB switch (side panel) → "RGB"
 G/OFF switch (side panel) → "G"
 R/OFF/B switch (side panel) → "OFF"
 S2 (TEST)/VA-121 board → "ON"
 S3 (γ ON/OFF)/PR-138E board → "ON"
 S4 (WHT CLIP)/PR-138E board → "ON"

RV1/PR-140 board → mechanical center
 RV3/PR-140 board → mechanical center
 RV4/PR-140 board → fully clockwise
 RV8/PR-140 board → fully clockwise
 RV10/PR-140 board → fully clockwise
 RV22/PR-138E board → fully counterclockwise
 RV23/PR-138E board → fully counterclockwise
 RV24/PR-138E board → fully counterclockwise

■ Adjustment procedures

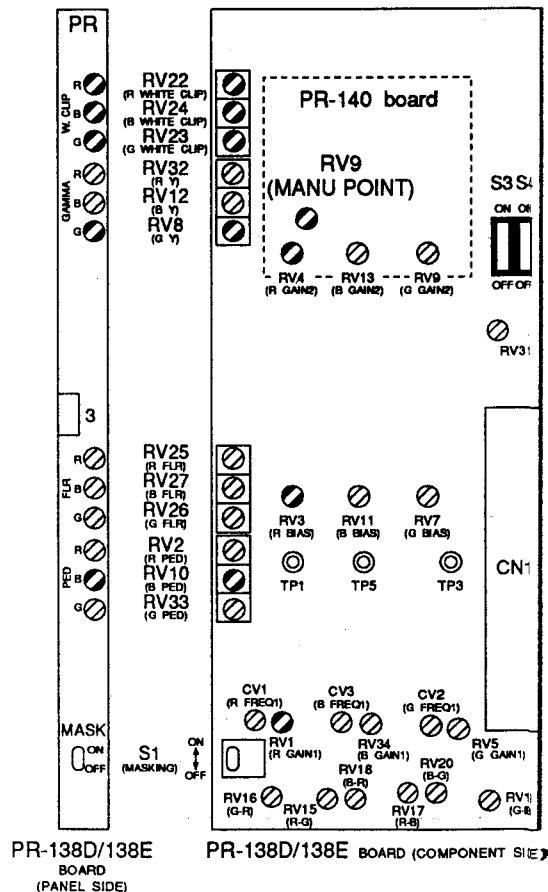
1. Adjust RV9 (MANU POINT)/PR-140 board so that the knee point level at TEST OUT terminal is 686 ± 10 mV.



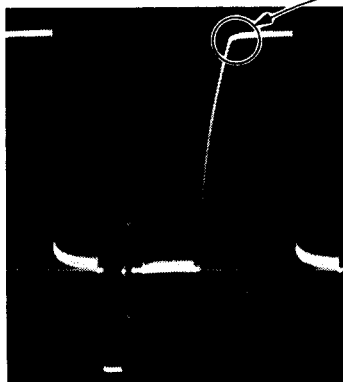
2. ENC/RGB switch (side panel) --> "ENC"



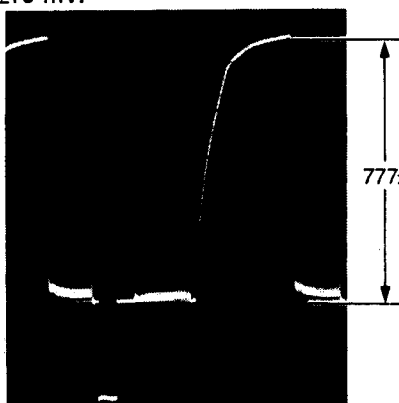
(Proceed to next page)



- Minimize the carrier leakage



- 777±10 mV



- Minimize the carrier leakage



PR

W CLIP
G
GAMA
R
G
R
G

RV22
(R WHITE CLIP)
RV24
(B WHITE CLIP)
RV23
(G WHITE CLIP)
RV32
(R V)
RV12
(B V)
RV8
(G V)

PR-140 board

RV4
RV3
RV1
RV9
RV10
RV6
RV7
TP1
RV5

S3 S4
ON ON
OFF OFF

PR-139 board

RV25
(R FLR)
RV27
(G FLR)
RV26
(G FLR)
RV2
(R PED)
RV10
(B PED)
RV33
(G PED)
RV1
(R FLR)
RV3
(B FLR)
RV2
(G FLR)
TP1
TP5
TP3

CN1

CV1
(R FREQ1)
CV3
(B FREQ1)
CV2
(G FREQ1)
RV1
(R GAIN1)
RV34
(B GAIN1)
RV18
(B-R)
RV20
(B-G)
RV5
(G GAIN1)
RV16
(G-R)
RV15
(R-G)
RV17
(R-B)
RV19
(G-B)

MASK
ON
OFF

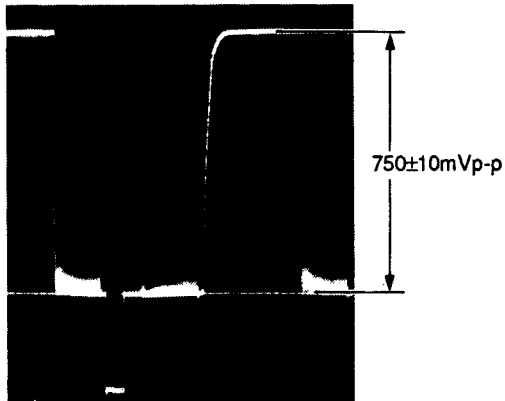
S1
(MASKING)

ON
OFF

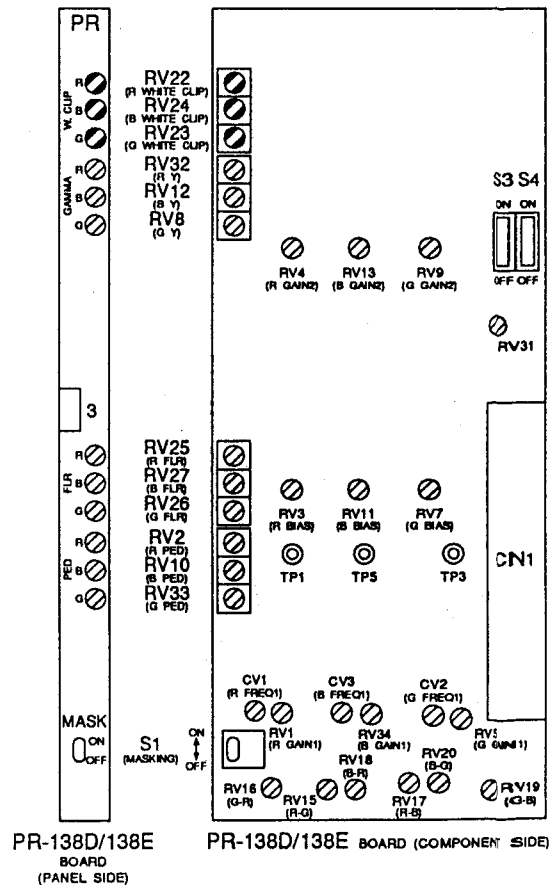
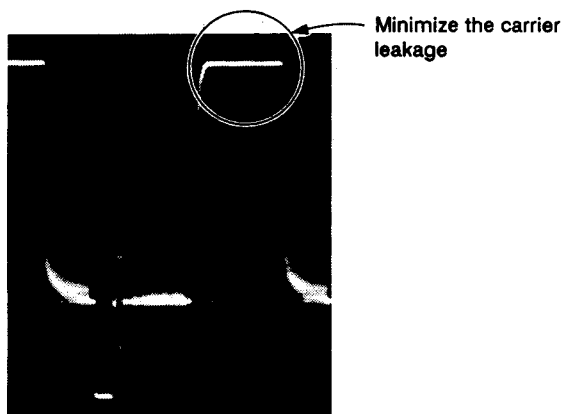
PR-138D/138E BOARD (PANEL SIDE)

PR-138D/138E BOARD (COMPONENT SIDE)

8. ■ ENC/RGB switch (side panel) → "RGB"
 ■ G/OFF switch (side panel) → "G"
 ■ GAIN switch (side panel) → "18"
9. Adjust ●RV23 **G WHITE CLIP** /PR-138E board so that the TEST SAW waveform clips at 750 ± 10 mVp-p.



10. ENC/RGB switch (side panel) → "ENC"
11. Adjust ●RV22 **R WHT CLIP** and ●RV24 **B WHT CLIP** /PR-138E board so that the carrier leakage of the TEST SAW waveform is minimized.



■ Note

After this adjustment is completed, be sure to carry out step 38. Automatic knee Adjustment.

Step38. Automatic Knee Adjustment

■ Note

Be sure to complete step 37. manual Knee White Clip Adjustment.

■ Setting

Equipment : Oscilloscope, Waveform monitor
To be extended : PR-138E board

Trigger : CP (TP35/extension board)

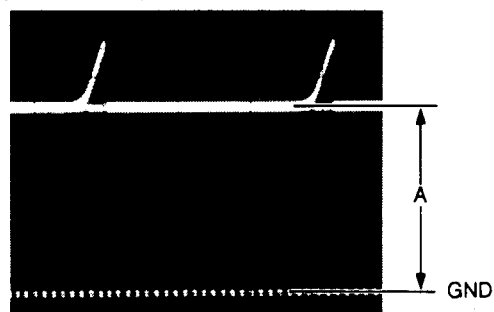
■ Preparation

OUTPUT/DCC switch (side panel) → "CAM/OFF"
GAIN switch (side panel) → "0"
ENC/RGB switch (side panel) → "ENC"
S2 (TEST)/VA-121 board → "ON"
S4 (WHT CLIP)/PR-138E board → "ON"

S3 (γ ON/OFF)/PR-138E board → "ON"
RV7 (AUTO LIMIT)/PR-140 board → mechanical center
RV16 (AUTO LIMIT)/PR-140 board → fully counterclockwise ↺

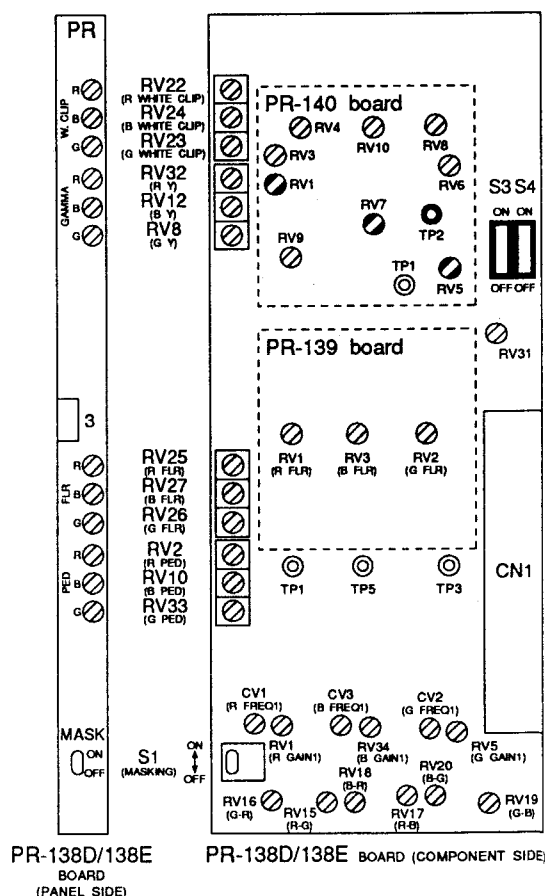
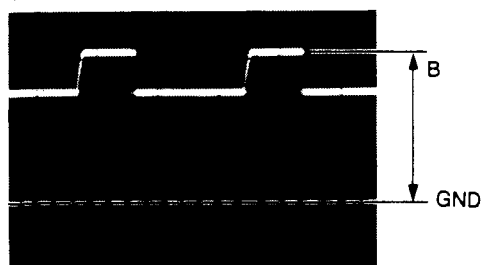
■ Adjustment procedures

1. Test point : TP1/PR-140 board
Adj. point : RV5/PR-140 board
Spec. : $A = 0.3 \pm 0.05 \text{ Vdc}$



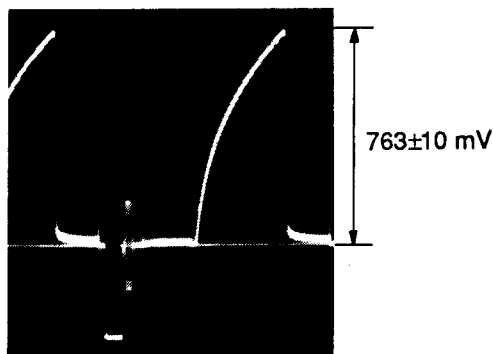
2. GAIN switch (side panel) → "18"

3. Test point : TP2/PR-140 board
Adj. point : RV7/PR-140 board
Spec. : $B = 0.35 \pm 0.05 \text{ Vdc}$

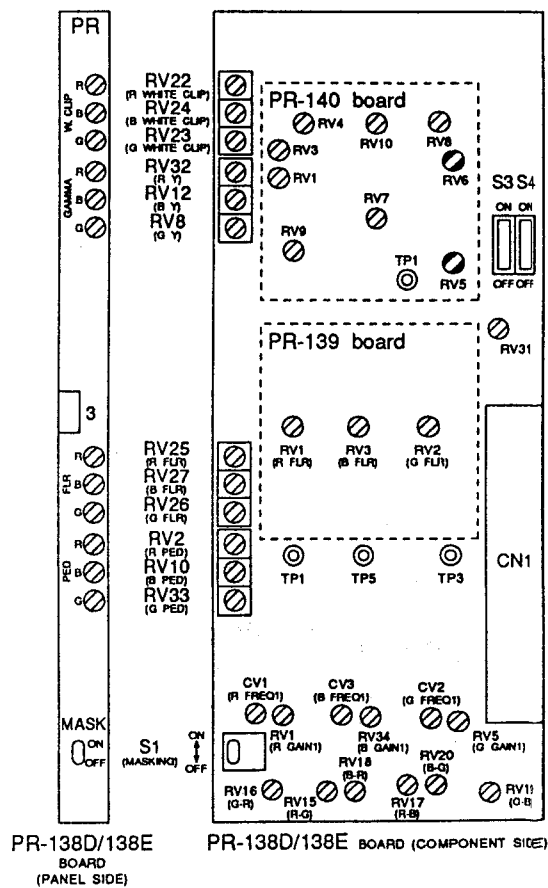
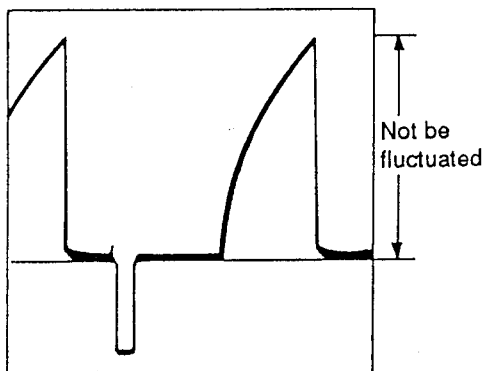


(Proceed to next page)

4. • OUTPUT/DCC switch (side panel) → "CAM/ON"
 - ENC/RGB switch (side panel) → "RGB"
 - G/OFF switch (side panel) → "G"
 - R/OFF/B switch (side panel) → "OFF"
5. Test point : TEST OUT terminal
 Adj. point : ●RV6/PR-140 board
 Adjust : Turn ●RV6 on PR-140 board clockwise until the peak part of TEST SAW waveform is 763 ± 10 mV



6. • GAIN switch (side panel) → "0"
 - Adjust ●RV5/PR-140 board so that the peak level of waveform does not change even if the DCC switch is set any position of ON or OFF.



■ Note

After this adjustment is completed, set the switches as follows:

- OUTPUT/DCC switch (side panel) → "CAM/OFF"
- GAIN switch (side panel) → "0"
- S2 **TEST** /VA-121 board → "OFF"

Step 39. White Clip Adjustment

■ Setting

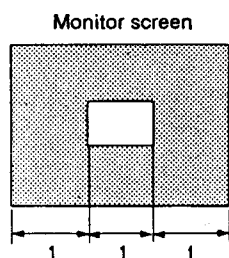
Object	: White window chart	To be extended	: IE-25AP board
Equipment	: Oscilloscope	Trigger	: TP10/extension board

■ Preparation

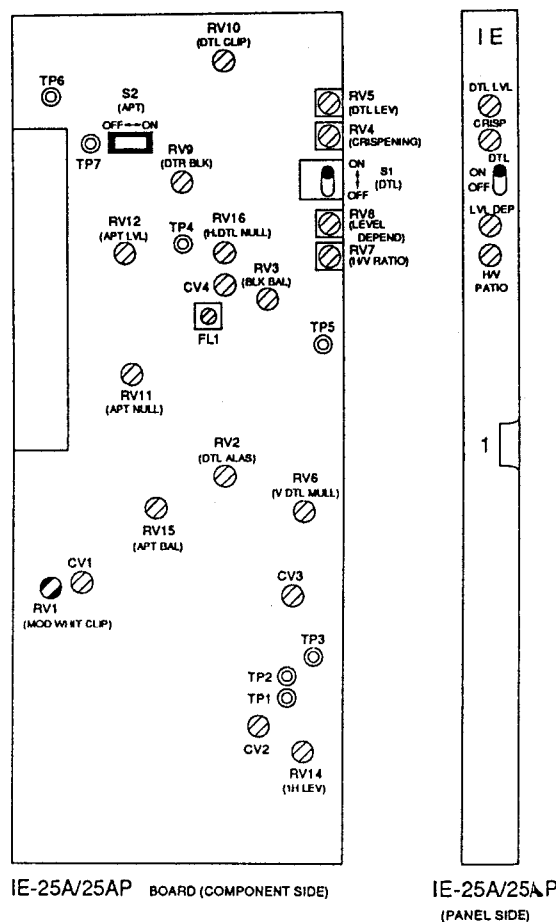
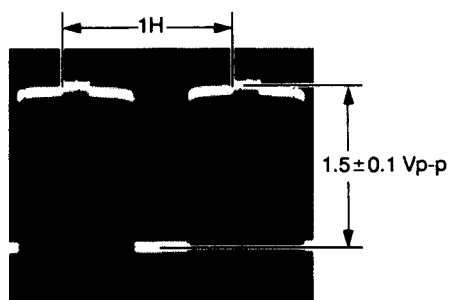
ENC/RGB switch (side panel)	→ "ENC"
GAIN switch (side panel)	→ "9"
S1 DTL /IE-25AP board	→ "ON"
S2 (APERTURE)/IE-25AP board	→ "OFF"

■ Adjustment procedures

1. Adjust the zoom control and shoot the white window chart as shown below.



2. Open the lens iris slowly and Adjust $\odot$ RV1 (MOD WHITE CLIP)/IE-25AP board so that the waveform at TP6/extension board clips at 1.5 ± 0.1 Vp-p.



■ Note

After this adjustment is completed, set the GAIN selector (side panel) to "0".

Step 40. Streaking Adjustment

■ Setting

Object : White window chart	To be extended : VA-121 board
Equipment : Waveform monitor	

■ Preparation

ENC/RGB switch (side panel)	→ "RGB"	Setting of waveform monitor	
S1 ☐ DTL /IE-25AP board	→ "OFF"	RESPONSE	→ "LOW PASS"
GAIN switch (side panel)	→ "0"	LINE SEL	→ "15 Lines"
RV53 RV54/VA-121 board	→ fully counter-clockwise ↺	FIELD	→ "2, 3"
RV52/VA-121 board	→ fully counter-clockwise ↺		

■ Adjustment procedures

Monitor screen

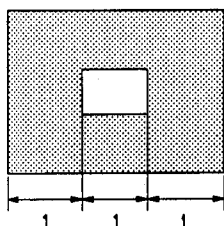


Fig.1

Monitor screen

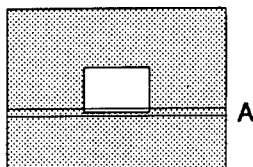
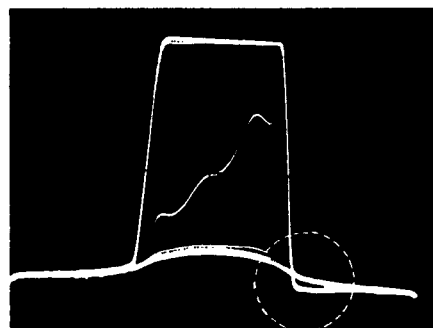


Fig.2

1. G/OFF switch (side panel) → "G"
R/OFF/B switch (side panel) → "OFF"
2. Lens iris → "F5.6"
3. Adjust the zoom control so that the white window chart is on the monitor (Fig-1) , and Adjust focus.
4. Open the lens iris fully.
5. Adjust the VAR control of LINE SELECTOR on the waveform monitor panel to select line "A" (Fig-2).
6. GAIN switch (side panel) → "0"
7. Adjust the RV3/PA-135 board and RV3/PA-135 board so that A and B portion become one line (Fig-3).
8. GAIN switch (side panel) → "18"
9. Adjust the RV3/PA-135 board and RV3/PA-135 board so that A and B portion become one line (Fig-3)

10. Repeat items 6 to 9 several times so that the fluctuation of A and B portion is minimum when changing the GAIN switch to "0" and "18" alternately.



G-ch: RV3
R-ch: RV1
B-ch: RV2



G-ch: CV6
R-ch: CV4
B-ch: CV5

A and B portions become one line.

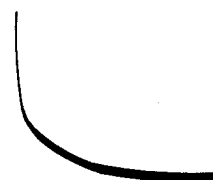


Fig.3

Step 41. V DTL Null Adjustment

■ Setting

Object : Grayscale chart
Equipment : Oscilloscope, Waveform monitor

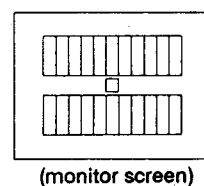
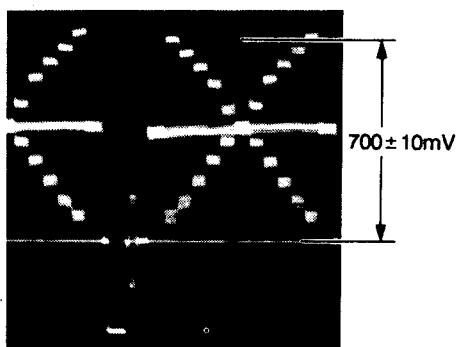
To be extended : IE-25AP board

■ Preparation

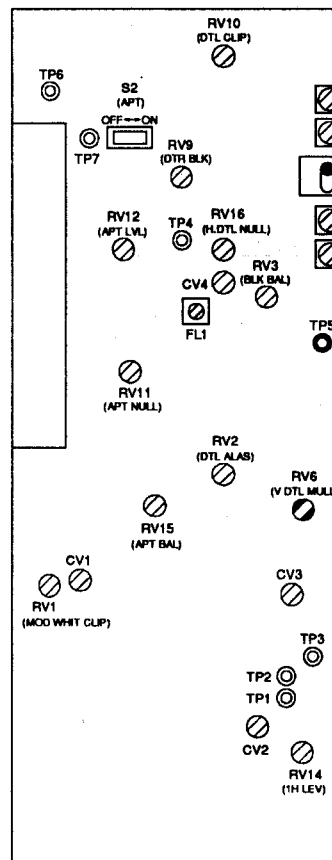
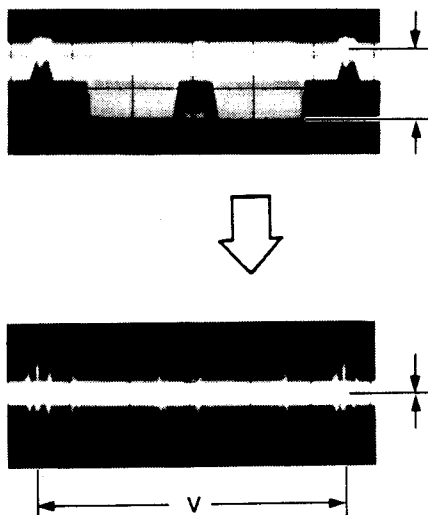
ENC/RGB switch (side panel) → "ENC"
S1 DTL / IE-25AP board → "ON"

■ Adjustment procedures

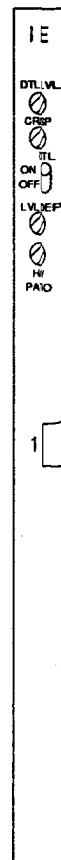
1. Adjust the zoom control so that the gray scale chart frame touches the underscanned picture frame on the monitor.
2. Adjust the iris control so that the white level at TEST OUT terminal is $700 \pm 10 \text{ mV}$.



3. Test point : TP5/IE-25AP board
Adj. point : RV6/IE-25AP board



IE-25A/25AP BOARD (COMPONENT SIDE)



IE-25A/25AP (PANEL SIDE)

Step 42. 1H, 2H DELAY Signal Phase Adjustment

■ Setting

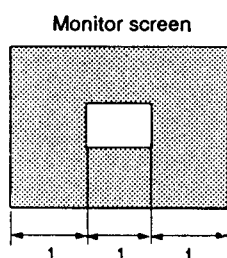
Object	: White window chart	To be extended	: IE-25AP board
Equipment	: Oscilloscope	Trigger	: TP10/extension board

■ Preparation

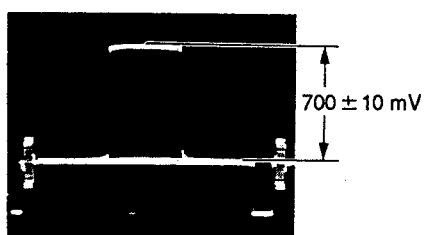
ENC/RGB switch (side panel)	→ "ENC"
S1 [DTL] /IE-25AP board	→ "ON"

■ Adjustment procedures

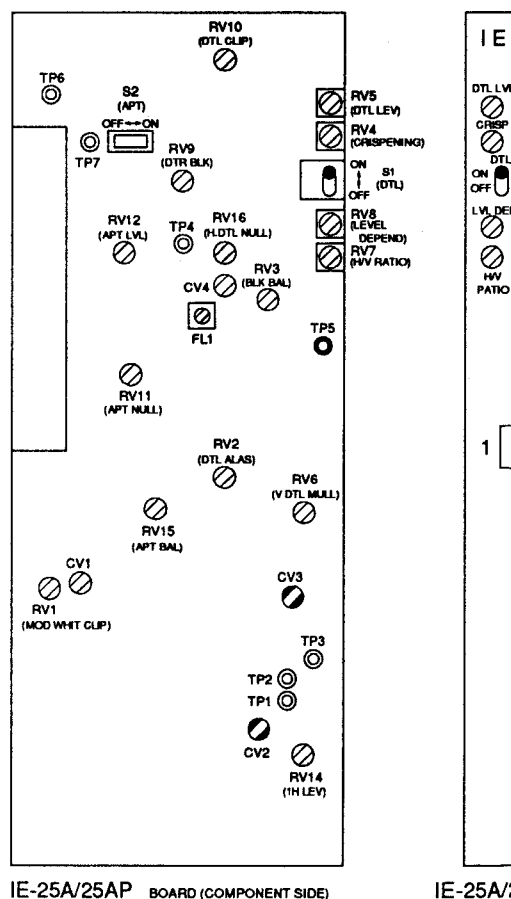
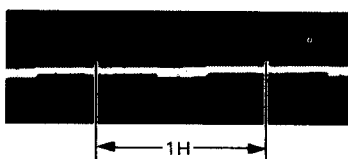
1. Adjust the zoom control and shoot the white window chart as shown below.



2. Adjust the iris control so that the white level at TEST OUT terminal is 700 ± 10 mV.



3. Test point : TP5(GND:E1)/IE-25AP board
Adj. point : ● CV2 ● CV3/IE-25AP board
Adjust : Adjust so that the detail signal is not added to the waveform.



IE-25A/25AP BOARD (COMPONENT SIDE)

IE-25A/25AP
(PANEL SIDE)

Step 43. H DTL Adjustment

■ Setting

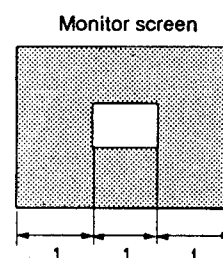
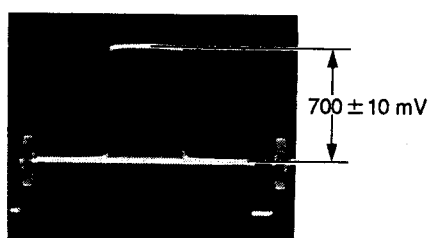
Object	: White window chart	To be extended	: IE-25AP board
Equipment	: Oscilloscope, Waveform monitor	Trigger	: TP10/extension board

■ Preparation

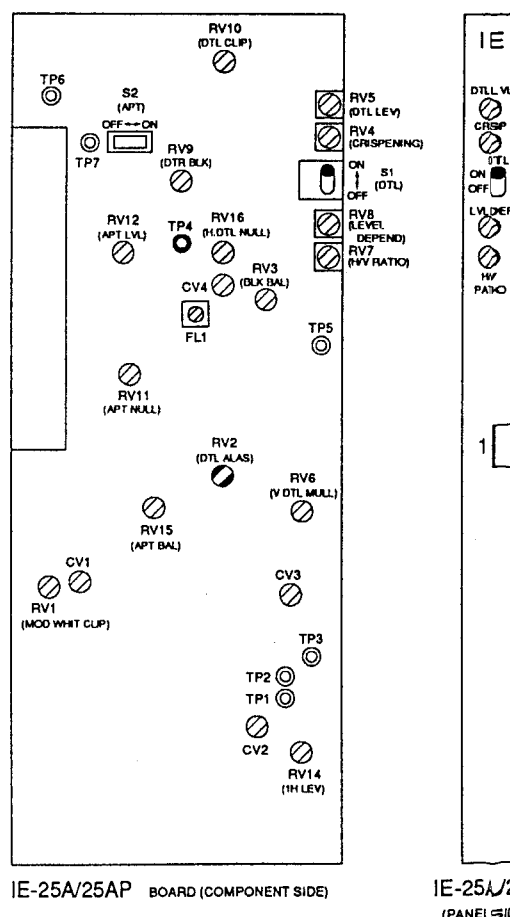
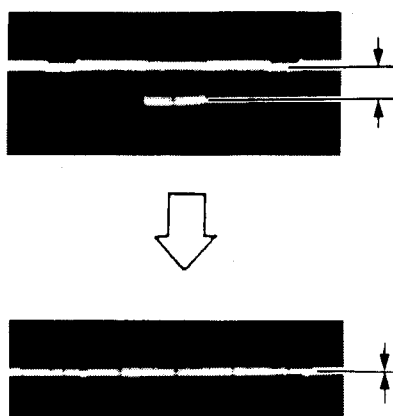
ENC./RGB switch (side panel)	→ "ENC"
S1 [DTL]/IE-25AP board	→ "ON"

■ Adjustment procedures

1. Adjust the zoom control and shoot the white window chart as shown right.
2. Adjust the iris control so that the white level at TEST OUT terminal is 700 ± 10 mV.



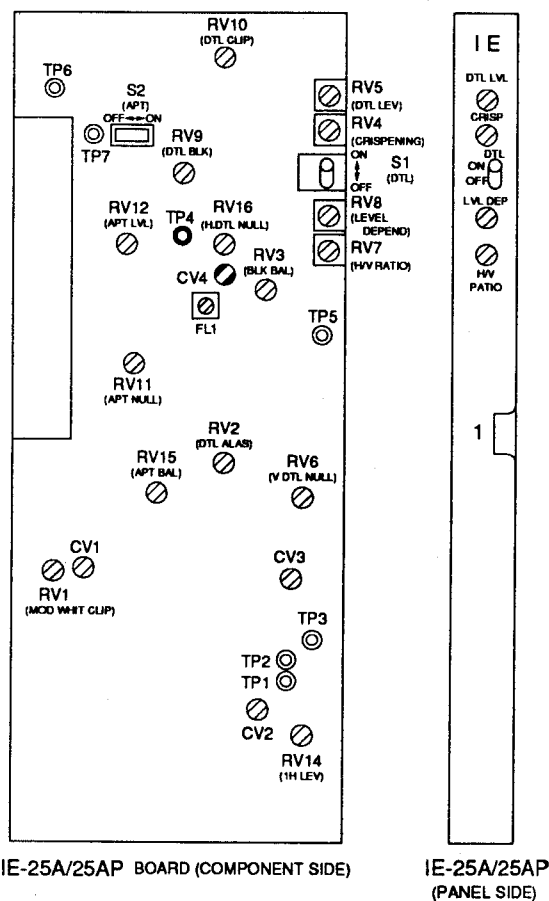
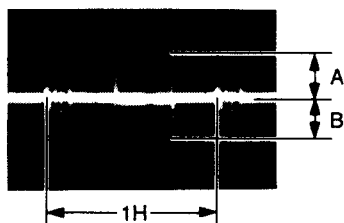
3. Test point : TP4/IE-25AP board
Adj. point : RV2/IE-25AP board



(Proceed to next page)

4. ●RV5 [DTL] /IE-25AP board →fully clockwise ↻

5. Test point : TP4/IE-25AP board
 Adj. point : ●CV4/IE-25AP board
 Spec. : A = B



■ Note

After this adjustment is completed, be sure to carry out step 44. Black Balance Adjustment.

Step 44. Black Balance Adjustment

- Setting

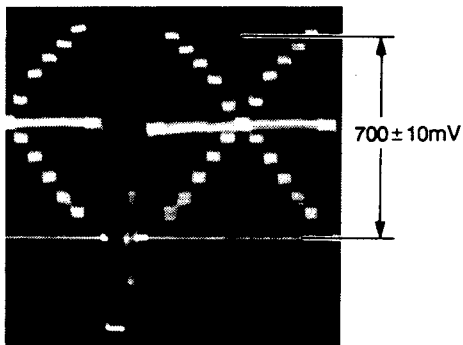
Object : Grayscale chart	To be extended : IE-25AP board
Equipment : Oscilloscope, Waveform monitor	Trigger : TP10/extension board

- Preparation

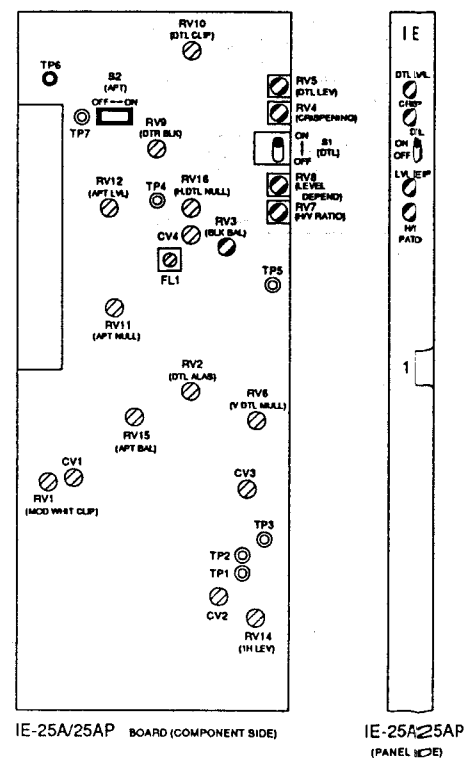
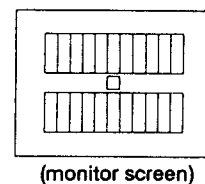
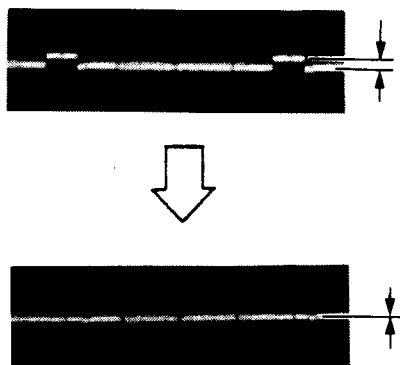
- S1 **DTL ON/OFF** /IE-25AP board → "ON"
 S2 (APERTURE) /IE-25AP board → "OFF"
 ●RV5 **DTL** /IE-25AP board → fully clockwise ↻
 ●RV4 **CRISP** /IE-25AP board → fully counterclockwise ↻
 ●RV8 **LEV DEP** /IE-25AP board → fully counterclockwise ↻
 ●RV7 **H/V RATIO** /IE-25AP board → mechanical center

- Adjustment procedures

1. Adjust the zoom control so that the gray scale chart frame touches the underscanned picture frame on the monitor.
2. Adjust the iris control so that the white level at TEST OUT terminal is 700 ± 10 mV.



3. Test point : TP6/IE-25AP board
Adj. point : ●RV3/IE-25AP board



- **Note**

After this adjustment is completed, be sure to carry out step 46. Level Dependent Adjustment.

Step 45. Crispening Adjustment

Note: The $\odot$ RV4 (CRISP) on the IE-25AP board is set to fully counterclockwise position at the factory. However, if you would like to change the crispening level, adjust as follows.

■ Setting

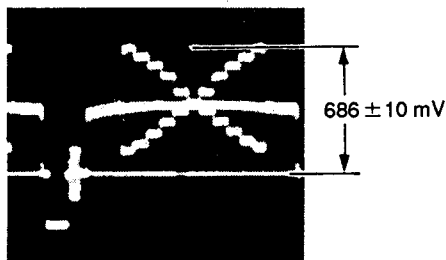
Object :	Grayscale chart
Equipment :	Waveform monitor

■ Preparation:

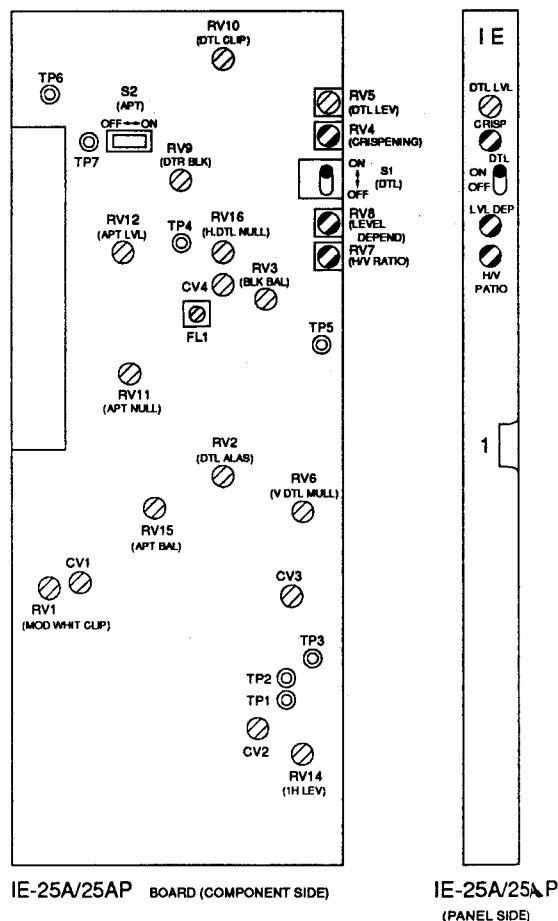
S1 (DTL ON/OFF)/IE-25AP board	→ "ON"
$\odot$ RV8 (LEV DEP)/IE-25AP board	→ fully counterclockwise $\curvearrowright$
$\odot$ RV7 (H/V RATIO)/IE-25AP board	→ fully counterclockwise $\curvearrowright$

■ Adjustment procedures

1. Adjust the zoom control so that the gray scale chart frame touches the underscanned picture frame on the monitor.
2. Adjust the iris control so that the white level at TEST OUT connector is 686 ± 10 mV.



3. Test point: TEST OUT connector
Adj. point: $\odot$ RV4 (CRISP)
Observe the waveform monitor and turn $\odot$ RV4/IE-25AP board clockwise $\curvearrowright$ until the noise on the black areas just starts to be reduced.
Otherwise adjust to your preferred level.



Step 46. Level Dependent Adjustment

■ Setting

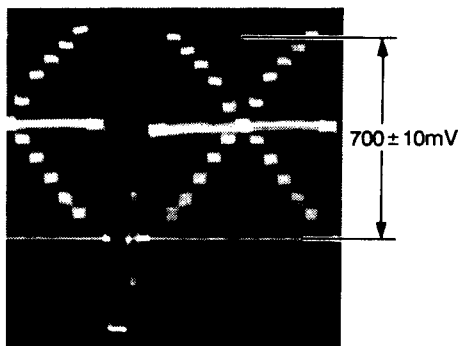
Object : Grayscale chart	Equipment : Waveform monitor (WFM)
--------------------------	------------------------------------

■ Preparation

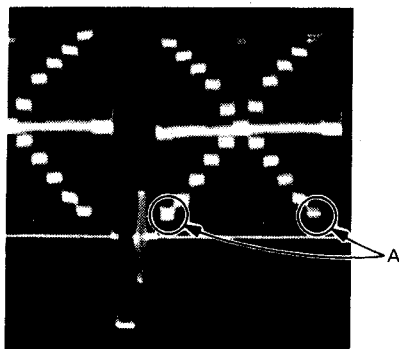
S1 **DTL ON/OFF** /IE-25AP board → "ON"
 S2 (APERTURE) /IE-25AP board → "OFF"
 ENC/RGB switch (side panel) → "RGB"
 G/OFF switch (side panel) → "G"
 R/OFF/B switch (side panel) → "OFF"

■ Adjustment procedures

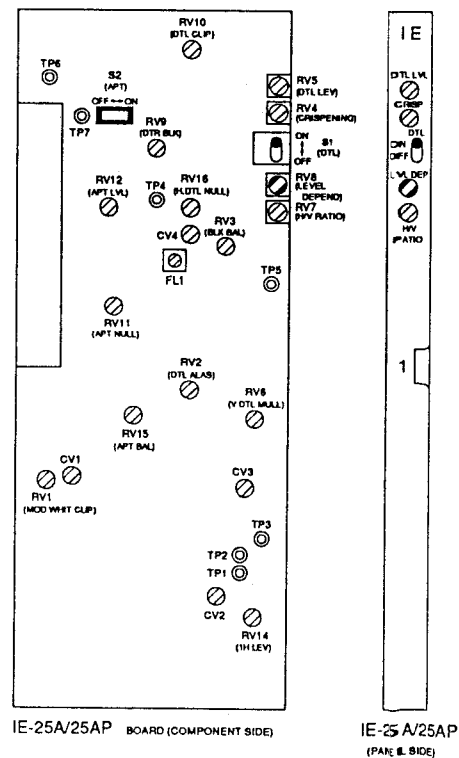
1. Adjust the zoom control so that the gray scale chart frame touches the underscanned picture frame on the monitor.
2. Adjust the iris control so that the white level at TEST OUT terminal is 700 ± 10 mV..



3. Test point : TEST OUT terminal
 Adj. point : RV8 **LEV DEP** /IE-25AP board
 Spec. : The detail signal is not added to the portion A of the waveform at TEST OUT terminal.



4. ENC/RGB switch (side panel) → "ENC"



■ Note

After this adjustment is completed, be sure to carry out step 49. H/V RATIO Adjustment.

Step 47. APERTURE DTL NULL Adjustment

■ Setting

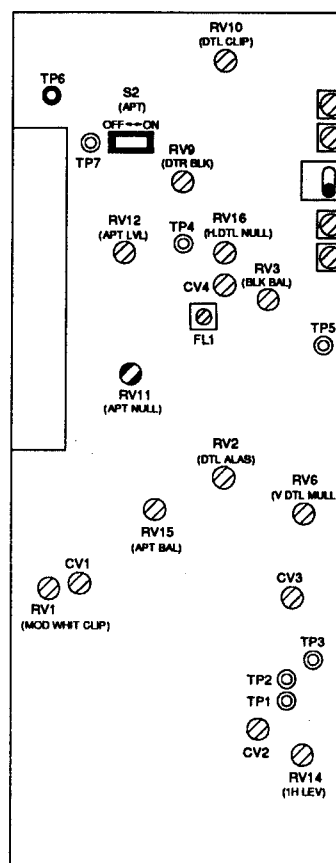
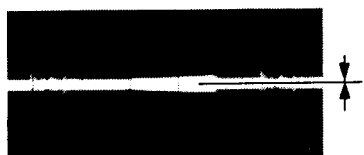
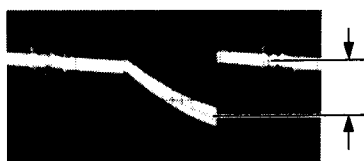
Equipment : Oscilloscope	Trigger : TP10/extension board
To be extended : IE-25AP board	

■ Preparation

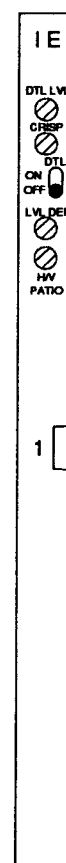
S2 TEST /VA-121 board	→ "ON"
S1 DTL ON/OFF /IE-25AP board	→ "OFF"
S2 (APERTURE) /IE-25AP board	→ "ON"

■ Adjustment procedures

Test point : TP6/IE-25AP board
 Adj. point : ● RV11/IE-25AP board
 Adjust :



IE-25A/25AP BOARD (COMPONENT SIDE)



IE-25A/25AP (PANEL SIDE)

Step 48. APERTURE Waveform Adjustment

■ Setting

Object : multiburst chart	To be extended : IE-25AP board
Equipment : Waveform monitor (WFM)	

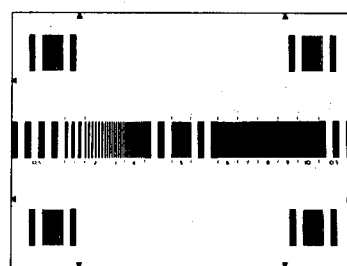
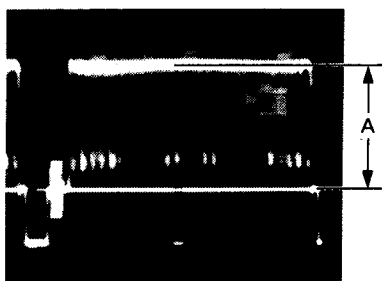
■ Preparation

S1 **DTL ON/OFF** /IE-25AP board → "OFF"
 S2 **(APERTURE)** /IE-25AP board → "ON"

■ Adjustment procedures

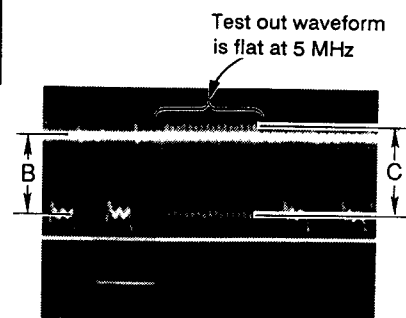
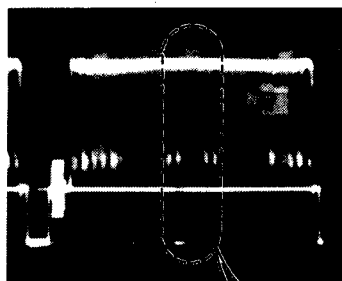
1. Adjust the zoom control so that the Multiburst chart frame touches the underscanned picture frame on the monitor.

2. Test point : TEST OUT terminal
 Adju. point : Lens iris
 Spec. : $A = 630 \pm 10 \text{ mV}$

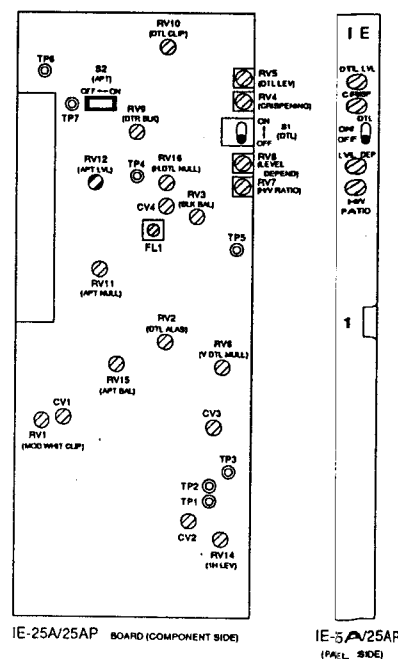


(monitor screen)

3. Test poing : TEST OUT terminal
 Adj. point : RV12/IE-25AP board
 Spec. : $B = C$ (B = Reference value)



Test out waveform
is flat at 5 MHz



Step 49. H/V RATIO Adjustment

■ Setting

Object : Grayscale chart

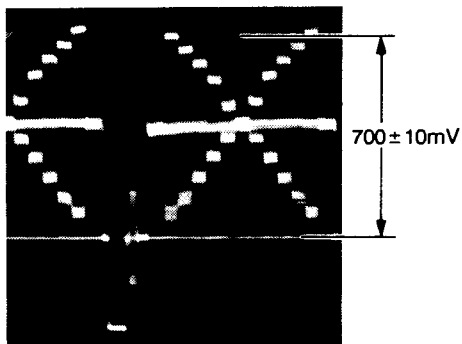
Equipment : Waveform monitor (WFM)

■ Preparation

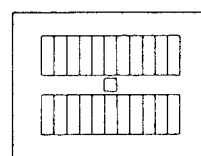
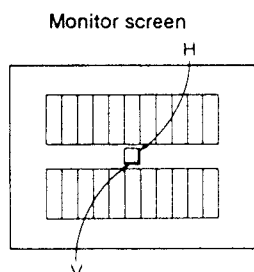
S1 **DTL ON/OFF** /IE-25AP board → "ON"
 S2 (APERTURE) /IE-25AP board → "OFF"
 ●RV5 **DTL** /IE-25AP board. → fully clockwise ↻

■ Adjustment procedures

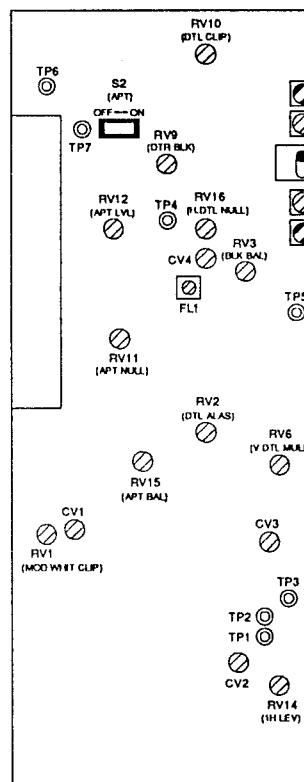
1. Adjust the zoom control so that the grayscale chart frame touches the underscanned picture frame on the monitor.
2. Adjust the iris control so that the white level at TEST OUT terminal is $700 \pm 10 \text{ mV}$.



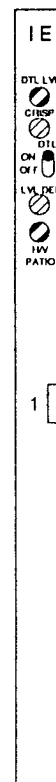
3. Adjust ●RV7 (H/V RATIO) /IE-25AP board so that the the H and V detail amounts to be added are equivalent.



(monitor screen)



IE-25A/25AP BOARD (COMPONENT SIDE)



IE-25A/25AP (PANEL SIDE)

■ Note

After this adjustment is completed, be sure to carry out step 50. Detail Level Adjustment.

Step 50. Detail Level Adjustment

■ Setting

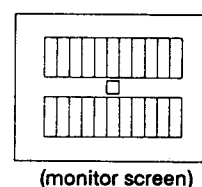
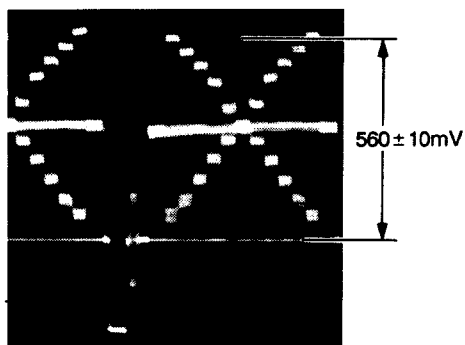
Object : Grayscale chart	Equipment : Waveform monitor (WFM)
--------------------------	------------------------------------

■ Preparation

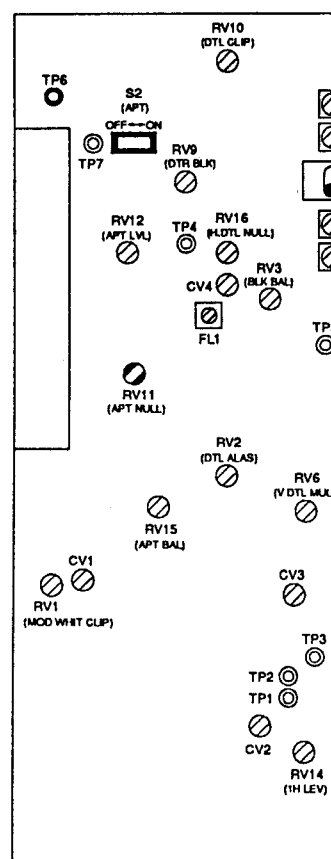
S1 DTL ON/OFF /IE-25AP board	→ "ON"
S2 (APERTURE) /IE-25AP board	→ "OFF"

■ Adjustment procedures

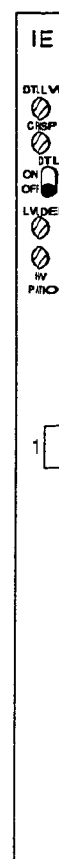
1. Adjust the zoom control so that the gray scale chart frame touches the underscanned picture frame on the monitor screen.
2. Adjust the iris control so that the white level at TEST OUT terminal is 560 ± 10 mV.



3. Test point : Monitor Screen
Adjust : Set the detail level according to the users' request by adjusting ⚙ RV5
DTL IE-25AP board



IE-25A/25AP BOARD (COMPONENT SIDE)



IE-25V/25AP (PANEL SIDE)

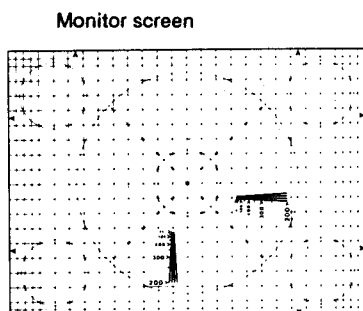
Step 51. Resolution Adjustment

■ Setting

Object : Registration chart, Resolution chart	Equipment : Waveform monitor
---	------------------------------

■ Adjustment procedures

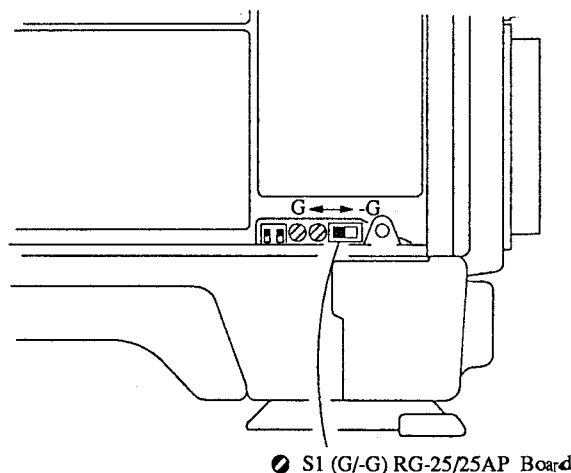
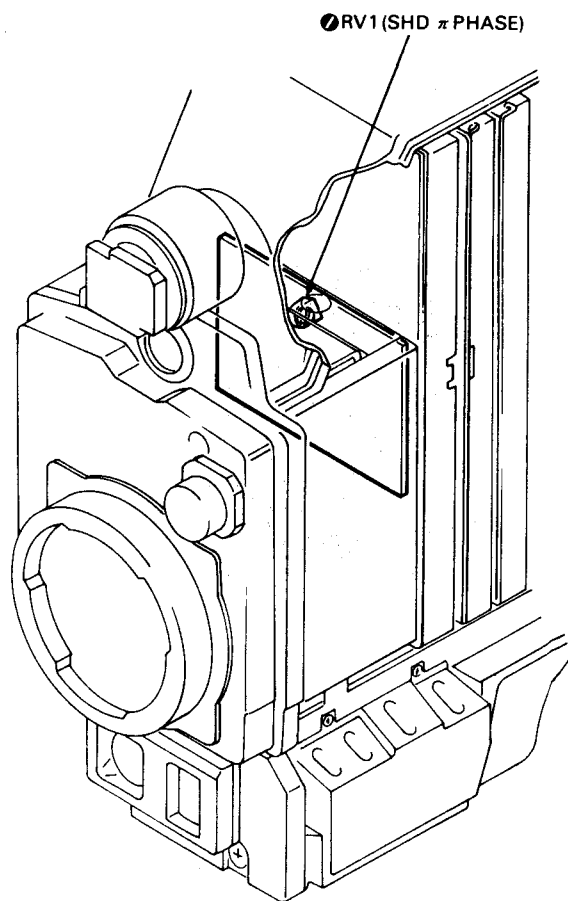
1. Adjust the zoom control so that the registration chart frame touches the underscanned picture frame on the monitor screen.



2. Adjust the iris control so that the white level at TEST OUT terminal is 700 ± 10 mV.
3.
 - S1 **DTL** /IE-25AP board → "OFF"
 - ENC/RGB switch (side panel) → "RGB"
 - G/OFF switch (side panel) → "OFF"
 - R/OFF/B switch (side panel) → "R"
 - S1 (G/-G)/RG-25AP board → "-G"
4. Adjust **RV1** (SHD π PHASE) TG-57AP board so that the picture error of R-ch and G-ch is minimized.
5.
 - ENC/RGB switch (side panel) → "ENC"
 - S1 **DTL** RG-25AP board → "ON"
 - Object → Resolution chart
 - Adjust the zoom control so that the resolution chart frame touches the underscanned picture frame on the monitor screen.
6. Make sure that the resolution of more than 700 TV lines can be seen on the monitor screen.

Note: After this adjustment is completed, set the switches as follows:

- ENC/RGB switch (side panel) → "ENC"
- S1 (G/-G)/RG-25AP board. → "G"



● S1 (G/-G) RG-25AP Board

Step 52. VF Marker B/W Level Adjustment

■ Setting

Equipment:	Waveform monitor	To be extended :	RG-25AP board
------------	------------------	------------------	---------------

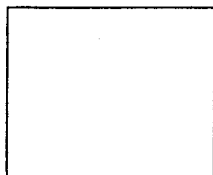
■ Preparation

ENC/RGB switch/camera side → "ENC"
 MARKER switch/Indicates both the center marker and the safety zone marker at the camera side.
 B/W reversing switch/RG-25AP board → "ON (above)"

■ Adjustment procedures

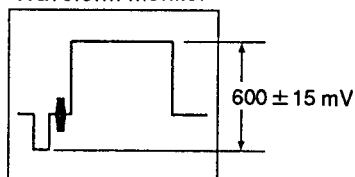
1. Adjust the zoom control so that the white window frame touches the underscanned picture frame on the monitor screen.

Monitor screen

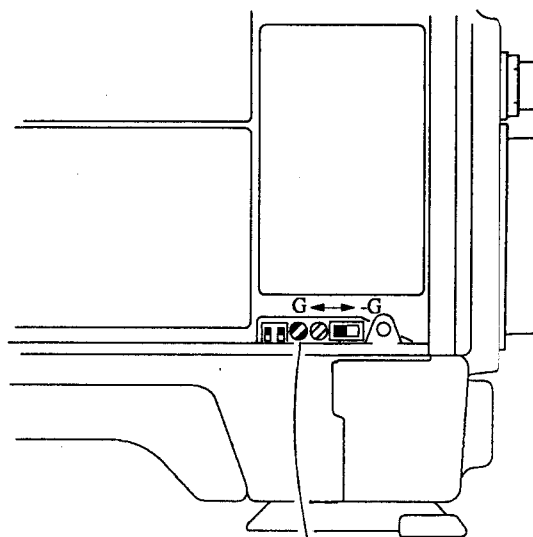


2. Test point : View finder monitor
 Adjust point : ● RV2/RG-25AP board
 Spec : $A = 600 \pm 15 \text{ mV}$.

Waveform monitor



3. Turn the ● RV2/RG-25AP board counterclockwise till the marker is white.
4. Turn the ● RV2/RG-25AP board counterclockwise till the marker is black.



● RV2/RG-25/25AP Board

Step 53. Power Save Adjustment

■ Setting

Equipment:	Digital Voltmeter	To be extended :	EN-69P board
------------	-------------------	------------------	--------------

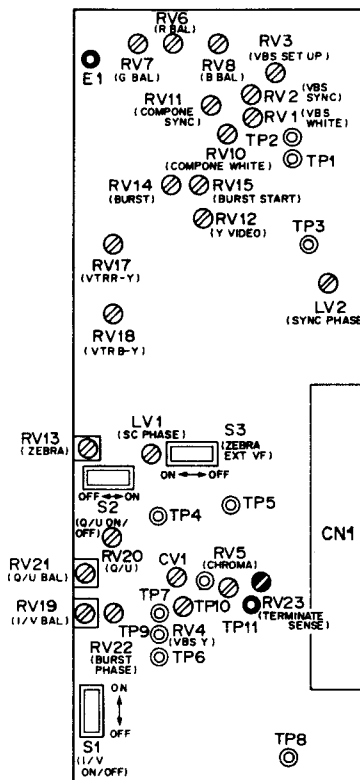
■ Adjustment procedures

Test point : TP11 (GND:E1)/EN-69P board

Adj. point : ● RV23/EN-69P board

Spec. : -0.45 ± 0.1 Vdc

Note : Confirm that the waveform at TP8/extension board is fed when the ENC/RGB selector (side panel) is set to "ENC" and it is not fed when the selector is set to "RGB".



EN-69/69P BOARD (COMPONENT SIDE)

Step 54. Auto Iris Adjustment

■ Setting

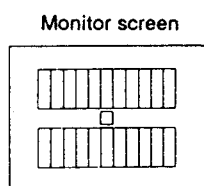
Object : Grayscale chart	Equipment : Waveform monitor
--------------------------	------------------------------

■ Preparation

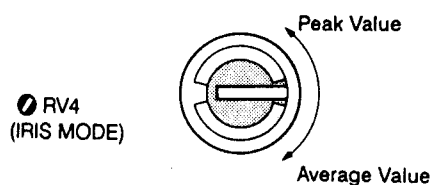
ENC/RGB switch (side panel)	→ "ENC"
Iris AUTO/MANU switch (Lens)	→ "AUTO"
OUTPUT/DCC switch (side panel)	→ "CAM/ON"

■ Adjustment procedures

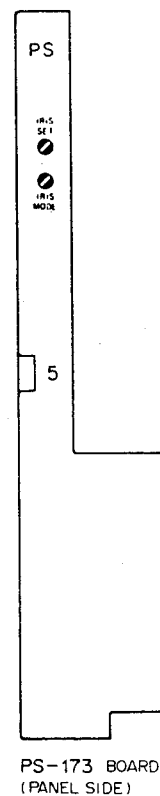
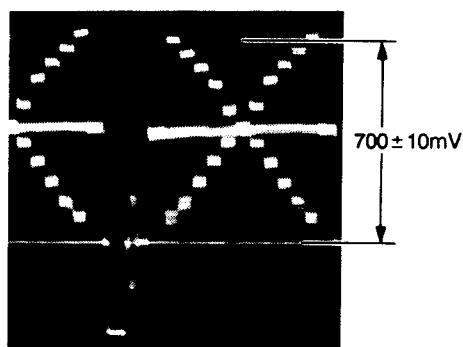
1. Adjust the zoom control so that the gray scale chart frame touches the underscanned picture frame on the monitor.



2. The iris control operation is controlled by mixing the peak level of the video signal with the average of it. That mixing ratio can be set by adjusting RV4 (IRIS MODE)/PS-173 board. Set the mode according to the users' request. Normally set it at the center.



3. Adjust RV5 (IRIS SET)/PS-173 board so that the white level at TEST OUT terminal is 700 ± 10 mV.



■ Note

After this adjustment is completed, set the iris control AUTO/MANU switch (Lens) at "MANU" and OUTPUT/DCC switch (side panel) at "CAM/OFF".

Step 55. LOW VIDEO Adjustment

■ Setting

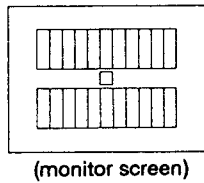
Object : Grayscale chart	Equipment : Waveform monitor
--------------------------	------------------------------

■ Preparation

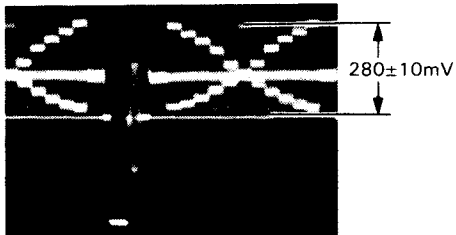
ENC/RGB switch (side panel) → "ENC"

■ Adjustment procedures

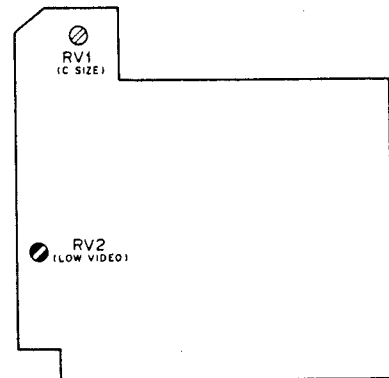
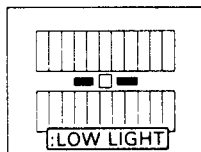
1. Adjust the zoom control so that the grayscale chart frame touches the underscanned picture frame on the monitor



2. Adjust the iris control so that the white level at TEST OUT terminal is 280 ± 10 mV.



3. Turn $\odot$ RV2 (LOW VIDEO)/AT-52A board from the leftmost position clockwise slowly until the "LOW LIGHT" is displayed on the VF screen.



AT-52A BOARD(SOLDERING SIDE)

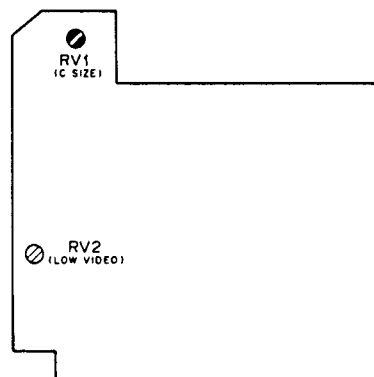
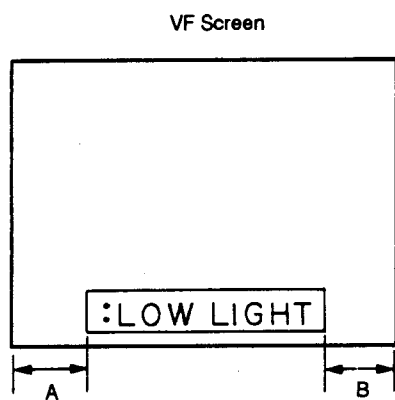
Step 56. Character Size Adjustment

■ Preparation

OUTPUT/DCC switch (side panel) → "CAM/OFF"
 ENC/RGB switch (side panel) → "ENC"
 Lend iris → Close "C"

■ Adjustment procedures

Test point : Viewfinder screen
 Adj. point : ● RV1 (CHR SIZE)/AT-52A board
 Spec. : A = B



AT-52A BOARD(SOLDERING SIDE)

Step 57. Preparation for Viewfinder System Adjustment

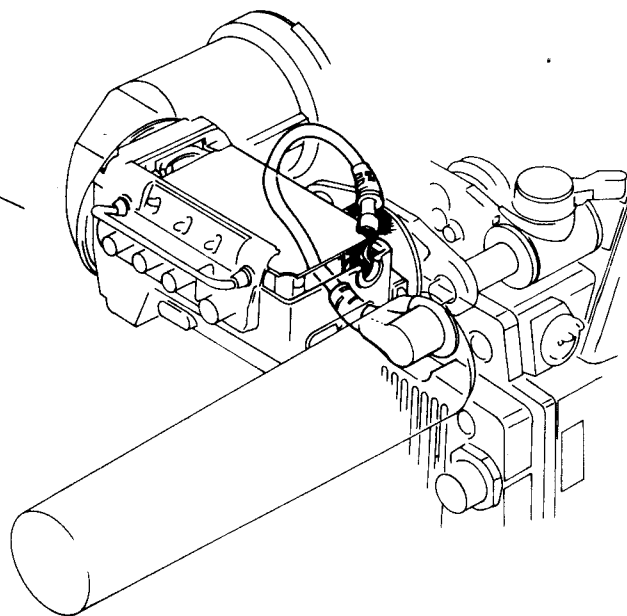
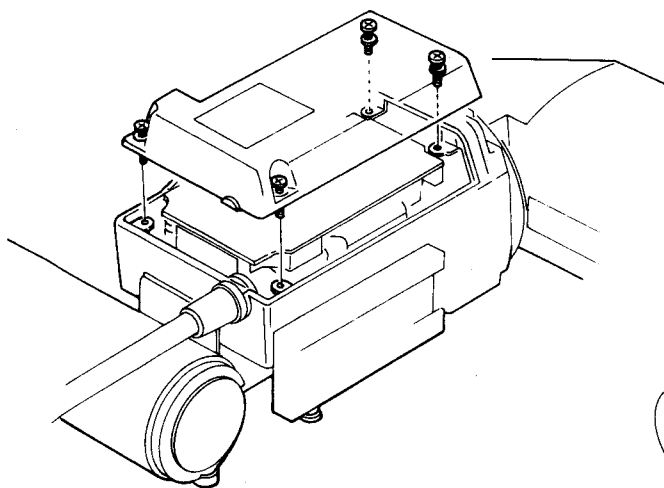
■ Note

Be sure to adjust the camera completely, or the following adjustments will become invalid.

■ Preparation

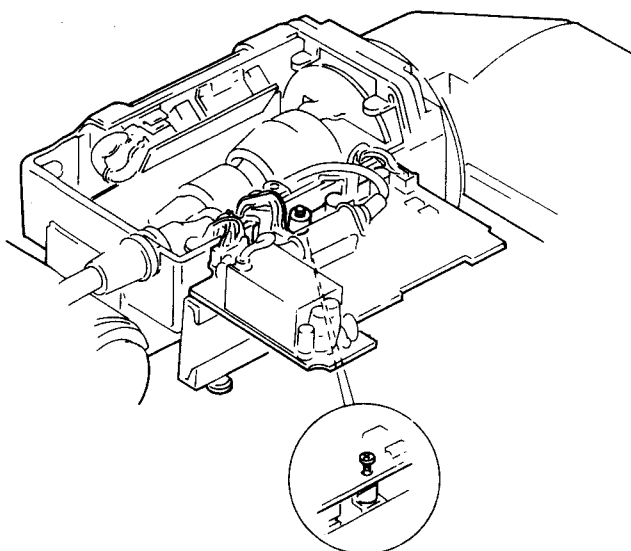
1. Set the power switch of AC Adaptor (AC-500CE or CMA-8CE) to "OFF".
4. Turn the component side of VF-41 board upwards for adjustments as shown below.

2. Remove the viewfinder from the camera and remove the VF cover.



3. Install the viewfinder to be turned upside shown on the camera.

5. Set the power switch of AC Adaptor (AC-500CE or CMA-8CE) to "ON".



Step 58. Vertical Hold Adjustment

■ Setting

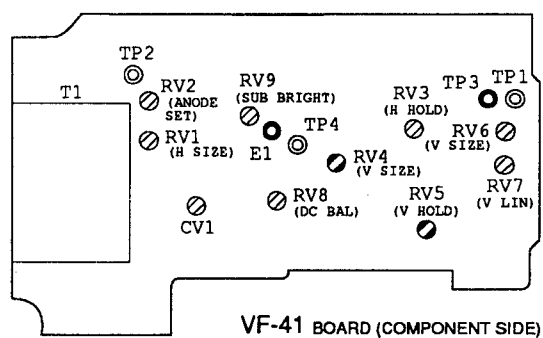
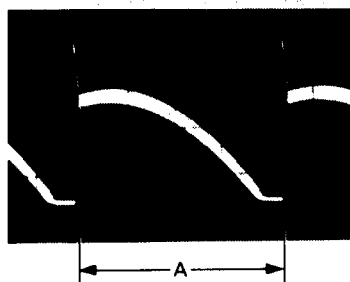
Equipment : Oscilloscope

■ Preparation

- Pull the EN-69P board out of the camera.
- Set $\odot$ RV4 (V SIZE)/VF-41 board to the mechanical center unless it is marked.

■ Adjustment procedures

Test point : TP3 (GND:E1)/VF-41 board
 Adj. point : $\odot$ RV5 (V HOLD)/VF-41 board
 Spec. : $A = 25.6 \pm 0.5$ msec



■ Note

After this adjustment is completed, insert the EN-69P board into the camera.

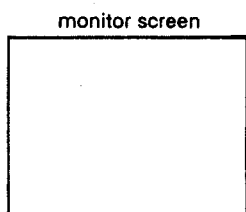
Step 59. Horizontal Hold Adjustment

■ Setting

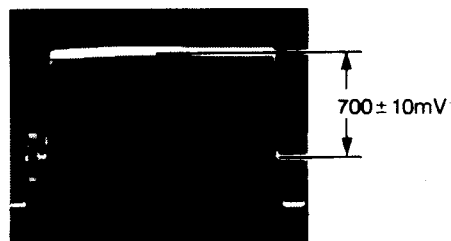
Object	: White window chart	Trigger	: CH2/oscilloscope
Equipment	: Oscilloscope, Waveform monitor		

■ Preparation

1. Adjust the zoom control so that the white window frame touches the underscanned picture frame on the monitor screen.

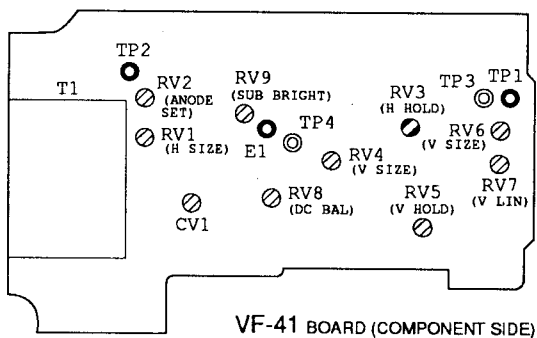
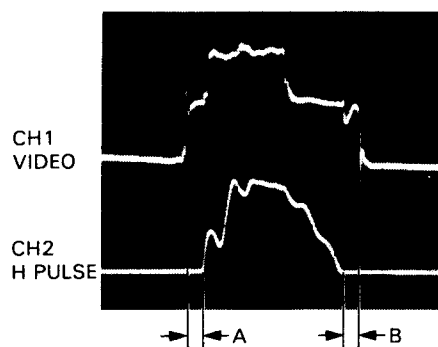


2. Adjust the iris control so that the white level at TEST OUT terminal is $700 \pm 10 \text{ mV}$.



■ Adjustment procedures

Test point : CH1 TP2 (GND:E1)/VF-41 board
 CH2 TP1 (GND:E1)/VF-41 board
 Adj. point : ☒ RV3 (H HOLD)/VF-41 board
 Spec. : A = B



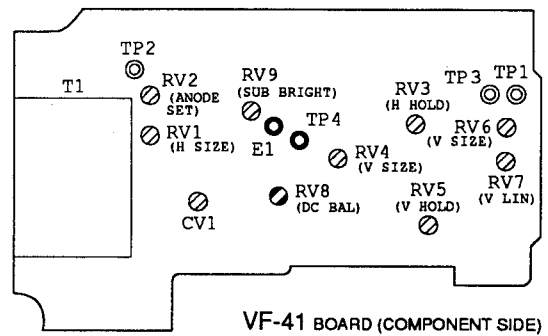
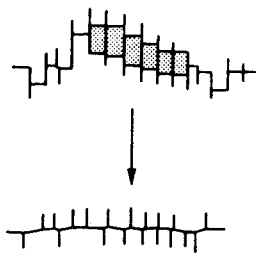
Step 60. DC Balance Adjustment

■ Setting

Equipment : Oscilloscope	CAM/BARS : BARS
--------------------------	-----------------

■ Adjustment procedures

Test point : TP4 (GND:E1)/VF-41 board
 Adj. point : ● RV8 (DC BALANCE)/VF-41 board
 Spec. : Only spike noises should appear at TP4.



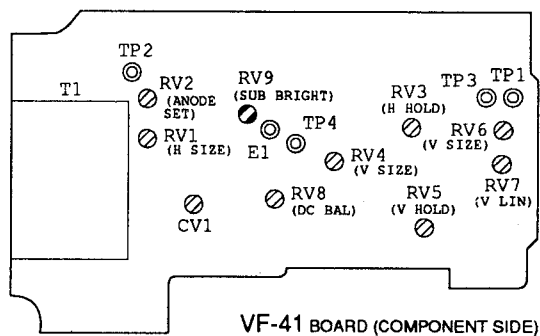
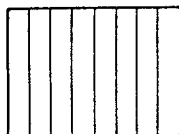
Step 61. BRIGHT SET Adjustment

■ Preparation

OUTPUT/DCC switch (side panel)	→ BARS/OFF
BRIGHT control (viewfinder)	→ fully clockwise ⤵
CONTR control (viewfinder)	→ fully clockwise ⤵

■ Adjustment procedures

Set the ●RV9/VF-41 at a position which is a little brighter than the darkest position of the color bar.



Step 62. Focus Adjustment

■ Note

Step 63. Picture Frame Adjustment and this adjustment affect each other. Repeat these adjustments until both specifications are satisfied.

■ Setting

Object : Resolution chart

Equipment : Waveform monitor

■ Preparation

Iris control AUTO/MANU switch (Lens) → "MANU"

BRIGHT control (viewfinder) → mechanical center

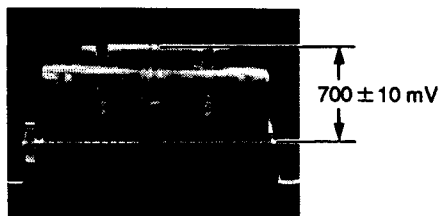
CONTR control (viewfinder) → fully clockwise

S1(PEAKING)/VF-41 board → "OFF"

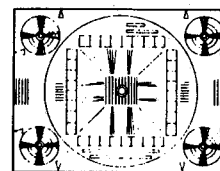
PEAKING control (viewfinder) → fully counter clockwise

■ Adjustment procedures

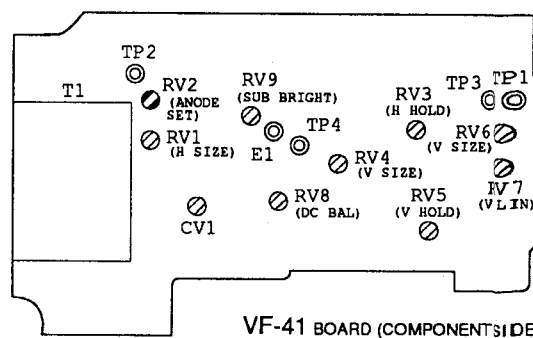
1. Adjust the zoom control so that the resolution chart touches the underscanned picture frame on the monitor.
2. Adjust the iris control so that the peak level at TEST OUT terminal is 700 ± 10 mV.



Monitor screen



3. Turn RV2/VF-41 board from the leftmost position to clockwise slowly until the picture on the viewfinder is best focused.
(Note: turn slowly)



VF-41 BOARD (COMPONENT SIDE)

■ Note

After the adjustment has been completed, confirm that a focus can be achieved regardless of positions where the BRIGHT and CONTRAST volumes are set.

Step 63. Picture Frame Adjustment

■ Note

Step 62. Focus Adjustment and this adjustment affect each other. Repeat these adjustments until both specifications are satisfied.

■ Setting

Object : Resolution chart

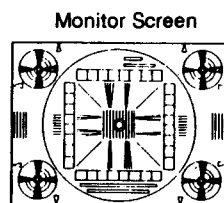
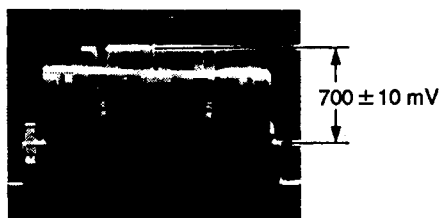
Equipment : Waveform monitor

■ Preparation

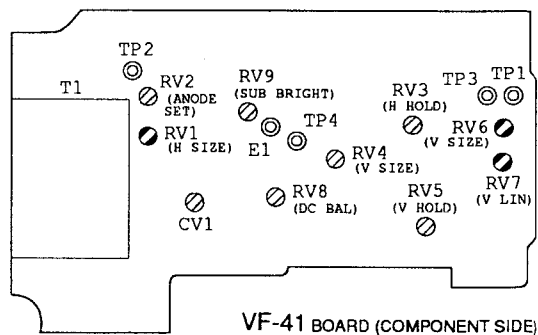
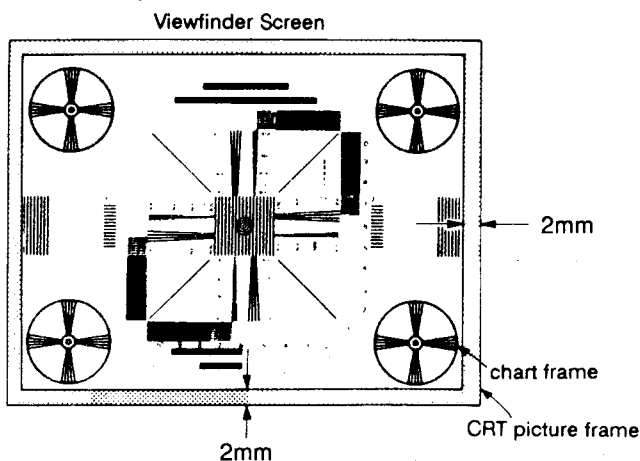
1. **BRIGHT** control (viewfinder) → mechanical center
CONTR control (viewfinder) → mechanical center
PEAKING control (viewfinder) → mechanical center
S1(PEAKING)/VF-41 board → "OFF"
2. Remove the eye cap from the viewfinder.

■ Adjustment procedures

1. Adjust the zoom control so that the resolution chart frame touches the underscanned picture frame on the monitor screen. Adjust the iris control so that the white level at TEST OUT terminal is 700 ± 10 mV.



2. Adjust **RV7(V LIN)/VF-41 board** so that the distortion of each circle at the four corners of resolution chart is minimized.
3. Adjust **RV1 (H SIZE)/VF-41 board** so that the H size of resolution chart is underscanned by approx. 2mm from the CRT picture frame.
4. Adjust **RV6 (V SIZE)/VF-41 board** so that the V size of resolution chart is underscanned by approx. 2mm from the CRT picture frame.



5. Adjust the centering magnet of the deflection coil so that the center of resolution chart is located at the center of VF screen.
6. Adjust the centering magnet of the deflection coil so that the resolution chart is located in the center of VF screen.
7. Repeat item 2 to item 6 until the specifications are satisfied.

Step 64. Peaking Adjustment

■ Setting

Resolution Chart

■ Preparation

Remove eye cup.

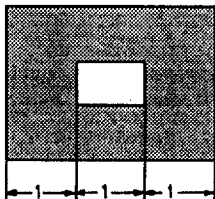
PEAKING volume/view finder → Return about 10 degrees to the left from the rightmost position.

BRIGHT volume/view finder → mechanical center

CONTRAST volume/view finder → mechanical center

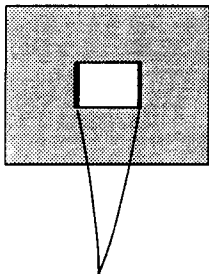
■ Adjustment procedures

1. Adjust the zoom control and shoot the white window chart as shown below.

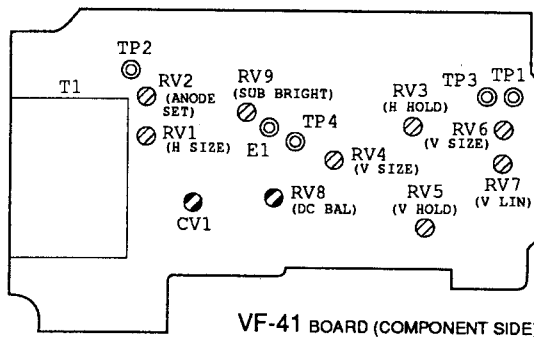


2. Adjust the iris control so that the white level at TEST OUT terminal is 350 ± 10 mV.
3. Adjust $\odot$ CV1/VF-41 board and $\odot$ RV8/VF-41 board so that the white window chart is as shown below.

picture of view finder



The peak level at edges should be the same.



VF-41 BOARD (COMPONENT SIDE)

4-3. PARTIAL ADJUSTMENT

Adjustments for the BVP-7AP are done in six steps.
See page 4-12 for details.

- Power supply system adjustment
- Synchronizing signal system adjustment
- Video signal system adjustment
- Detail signal system adjustment
- Automatic control system adjustment
- Viewfinder system adjustment

Partial adjustment is useful for each step except following adjustment.

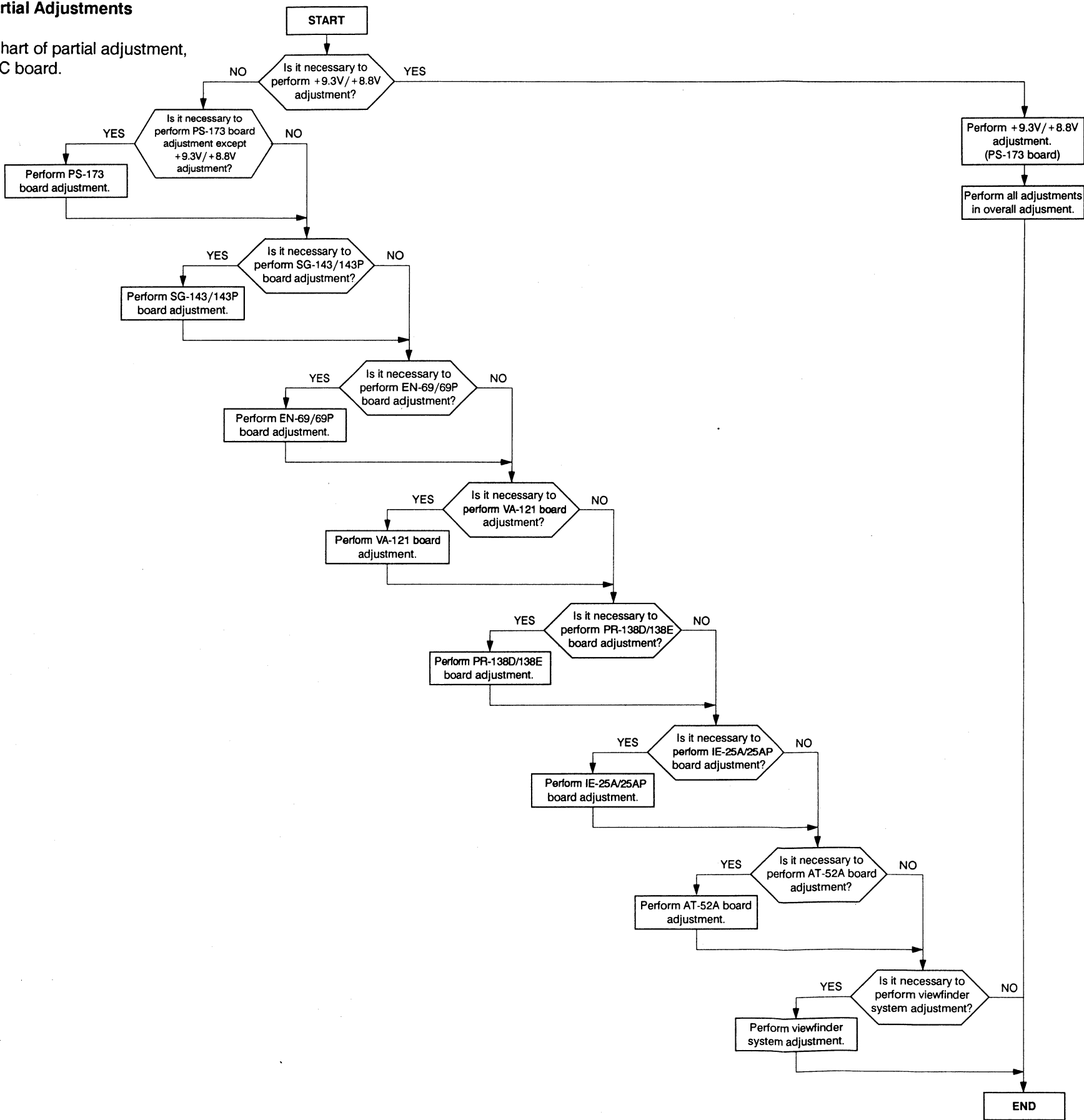
* +9.3V/8.8V Adjustment (Power supply system)
When this adjustment is done, be sure to perform all adjustments in Section 4-2 "OVERALL ADJUSTMENT".

Before beginning the partial adjustments, refer to following sections.

- 4-1-2. Connection and Initial setting
- 4-1-3. Precautions on adjustments

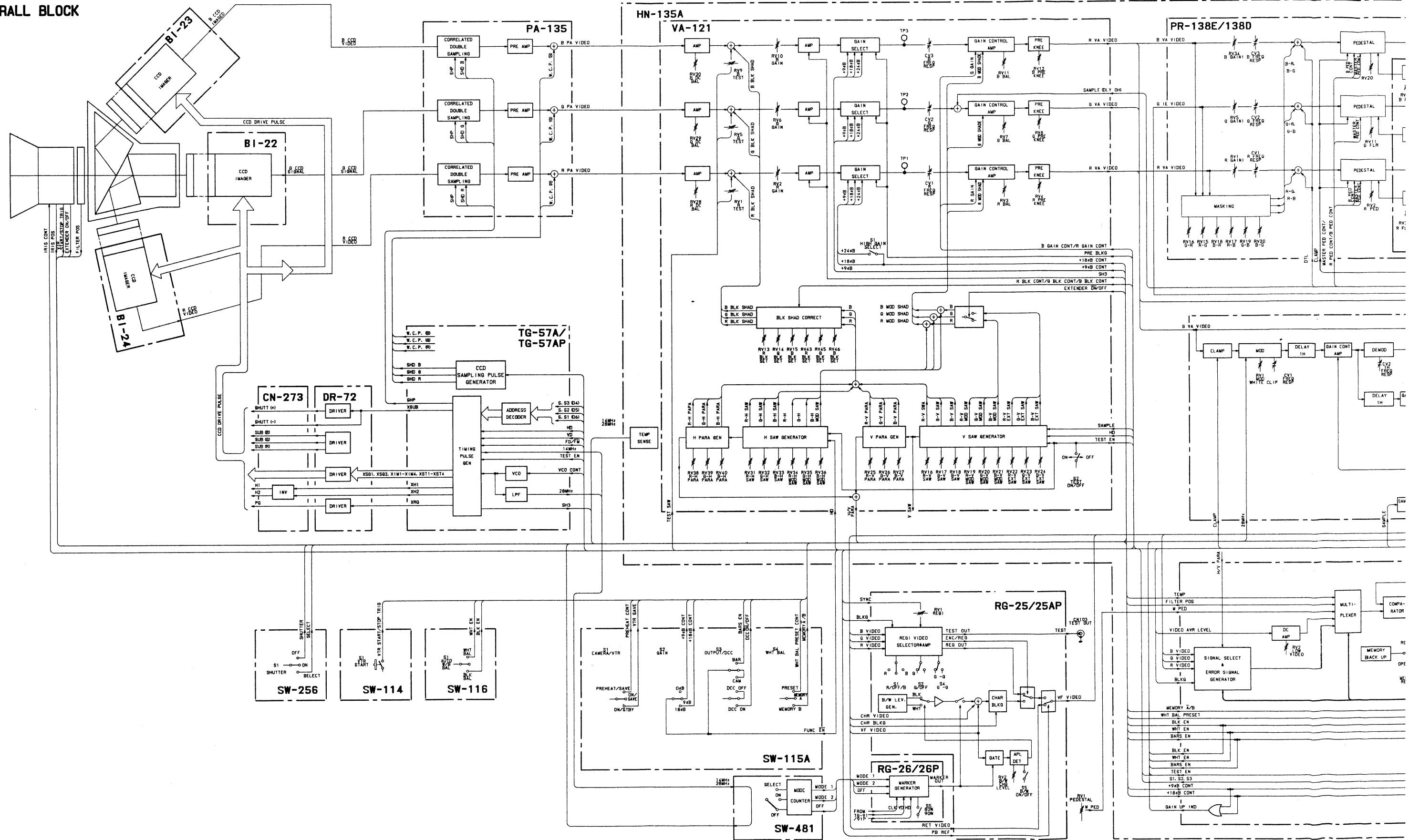
4-3-1. Flowchart of Partial Adjustments

Figure 4-1 shows a flowchart of partial adjustment, which is done for each PC board.



SECTION A BLOCK DIAGRAMS

OVERALL BLOCK



BVP-7A (J. UC)
BVP-7AP (EK)
[B-BVP7A-OVERALL BLOCK/M]

A-1

B

C

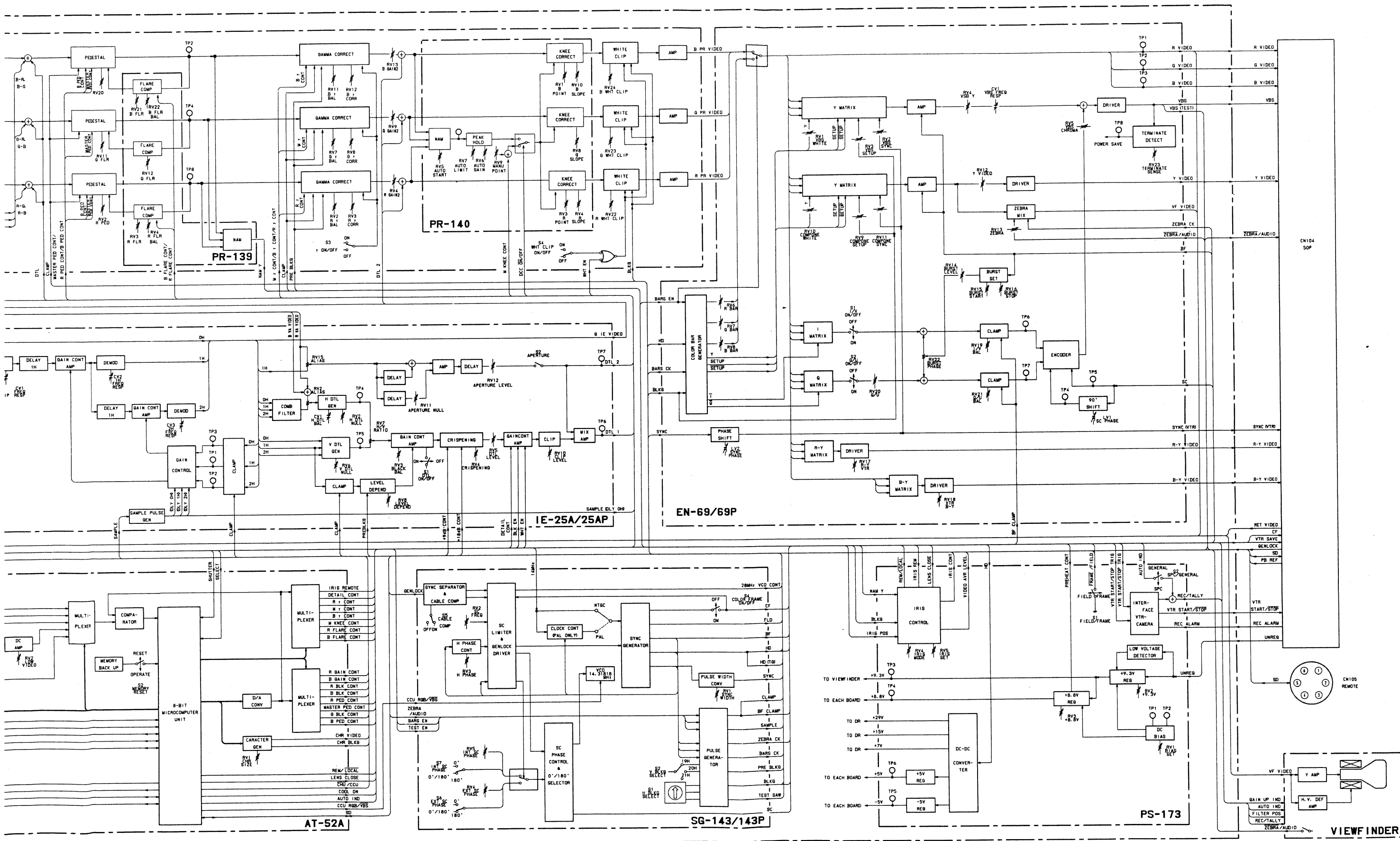
D

E

A-2

F

G



A-3

A-4

G

H

I

J

K

L

M

CCD BLOCK

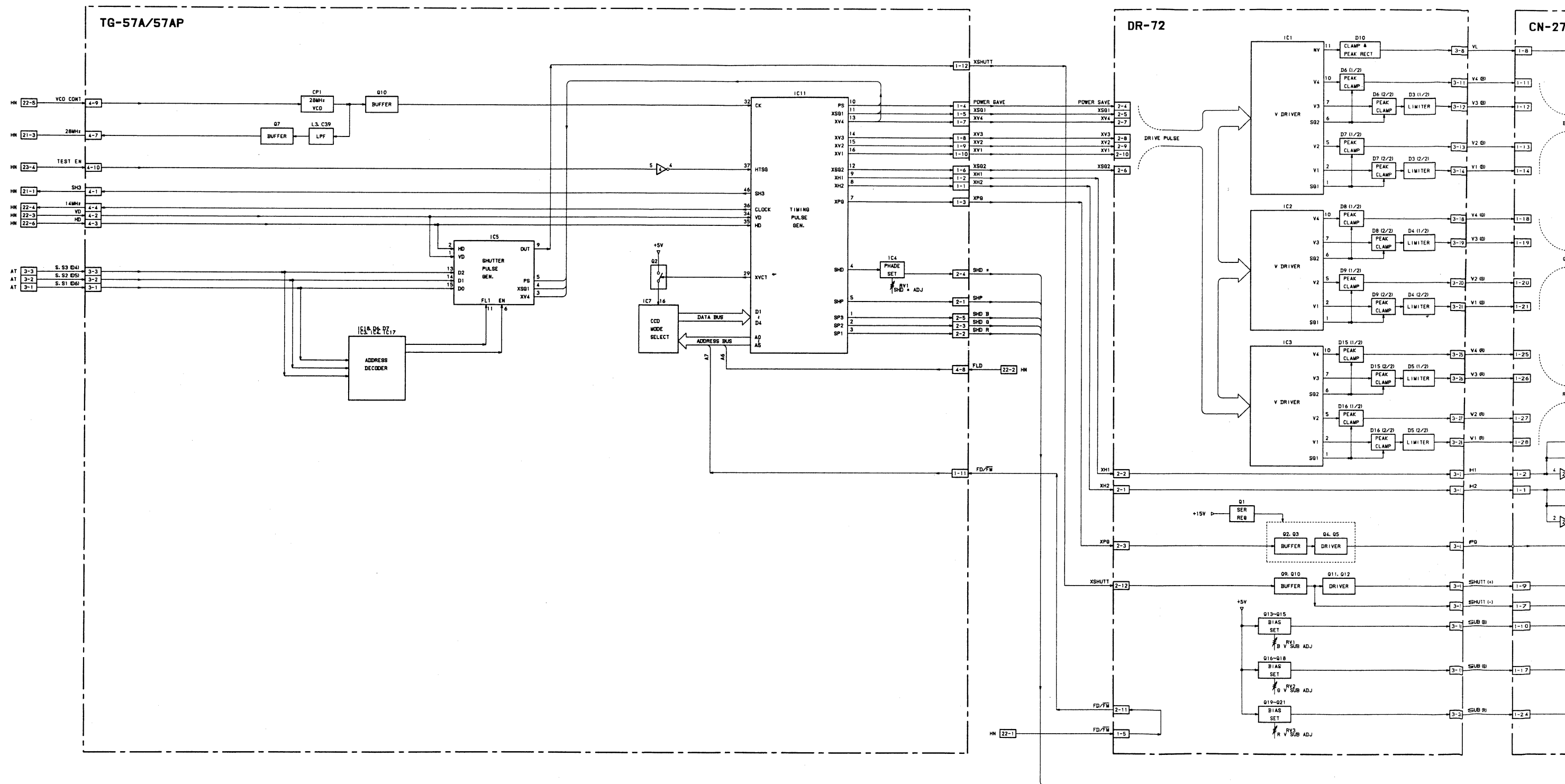
TG-57A/57AP

DR-72

CN-273

BI-22/23/24

PA-135



A-5

A-6

A

B

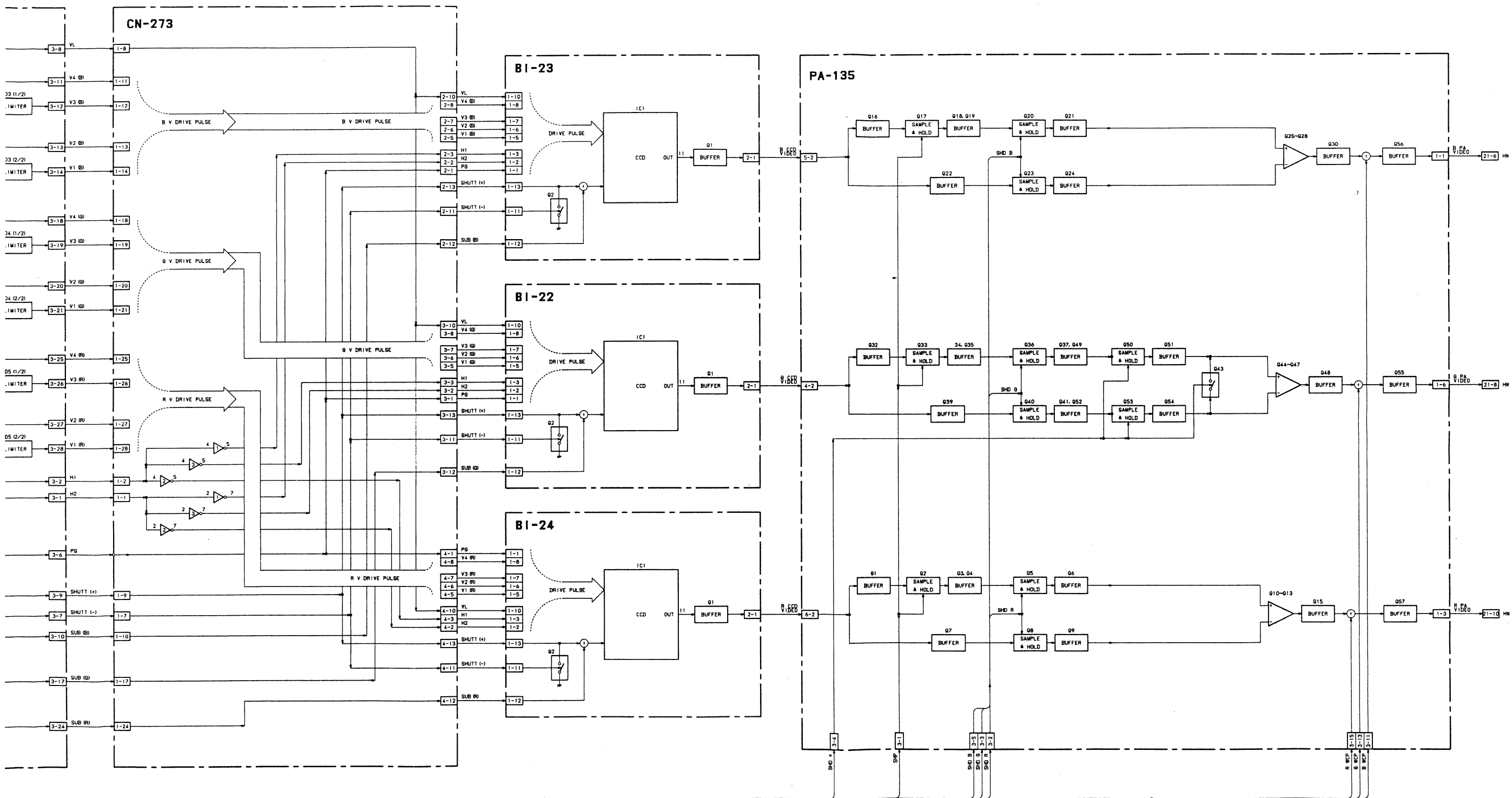
C

D

E

F

G

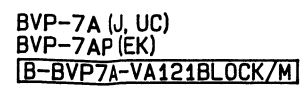


A-7

A-8

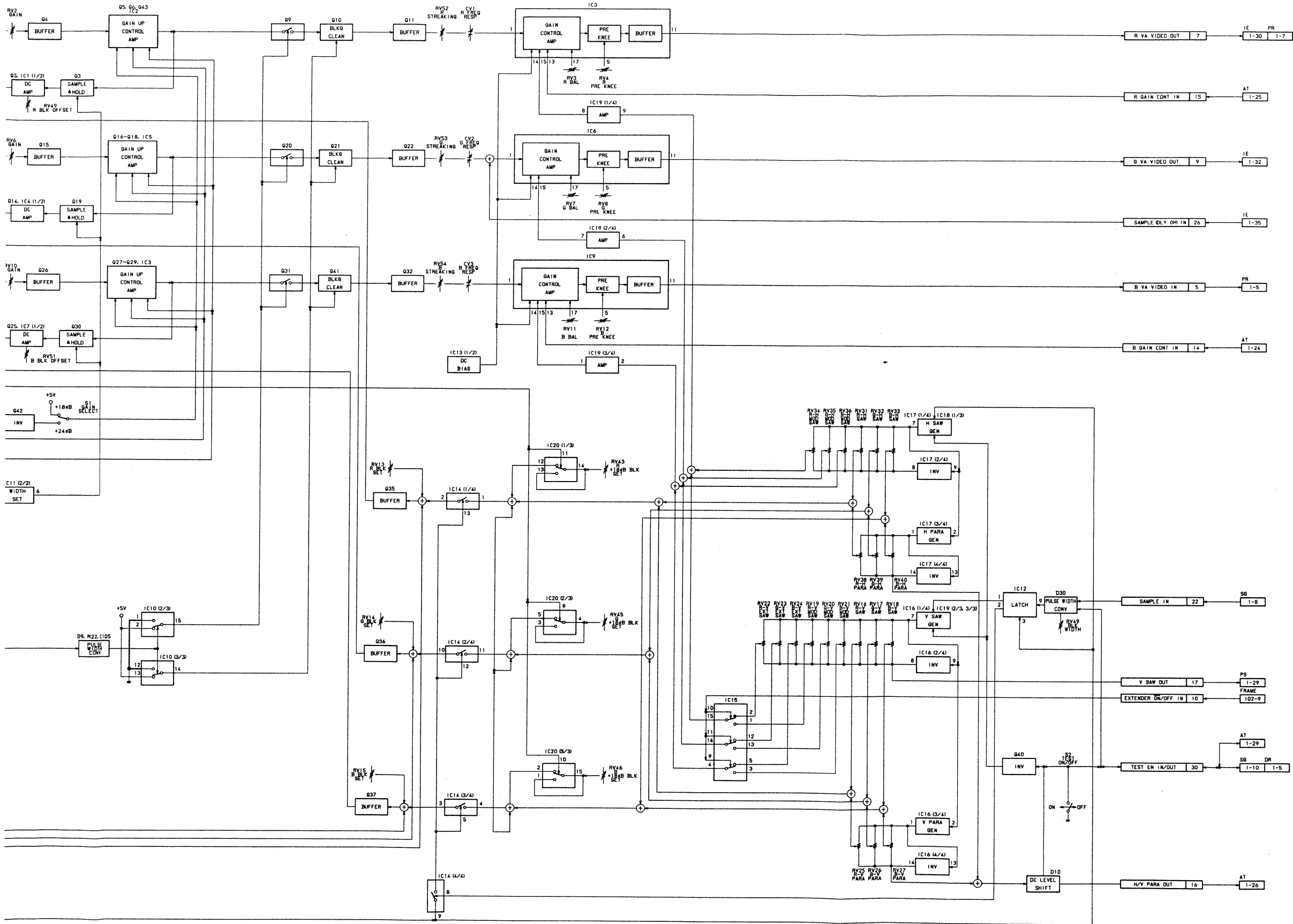
BVP-7A (J, UC)
BVP-7AP (EK)
B-BVP7A-CCDBLOCK/M

VA-121 VA-121



A-10

G



A-10

A-11

D

E

F

G

H

I

1

2

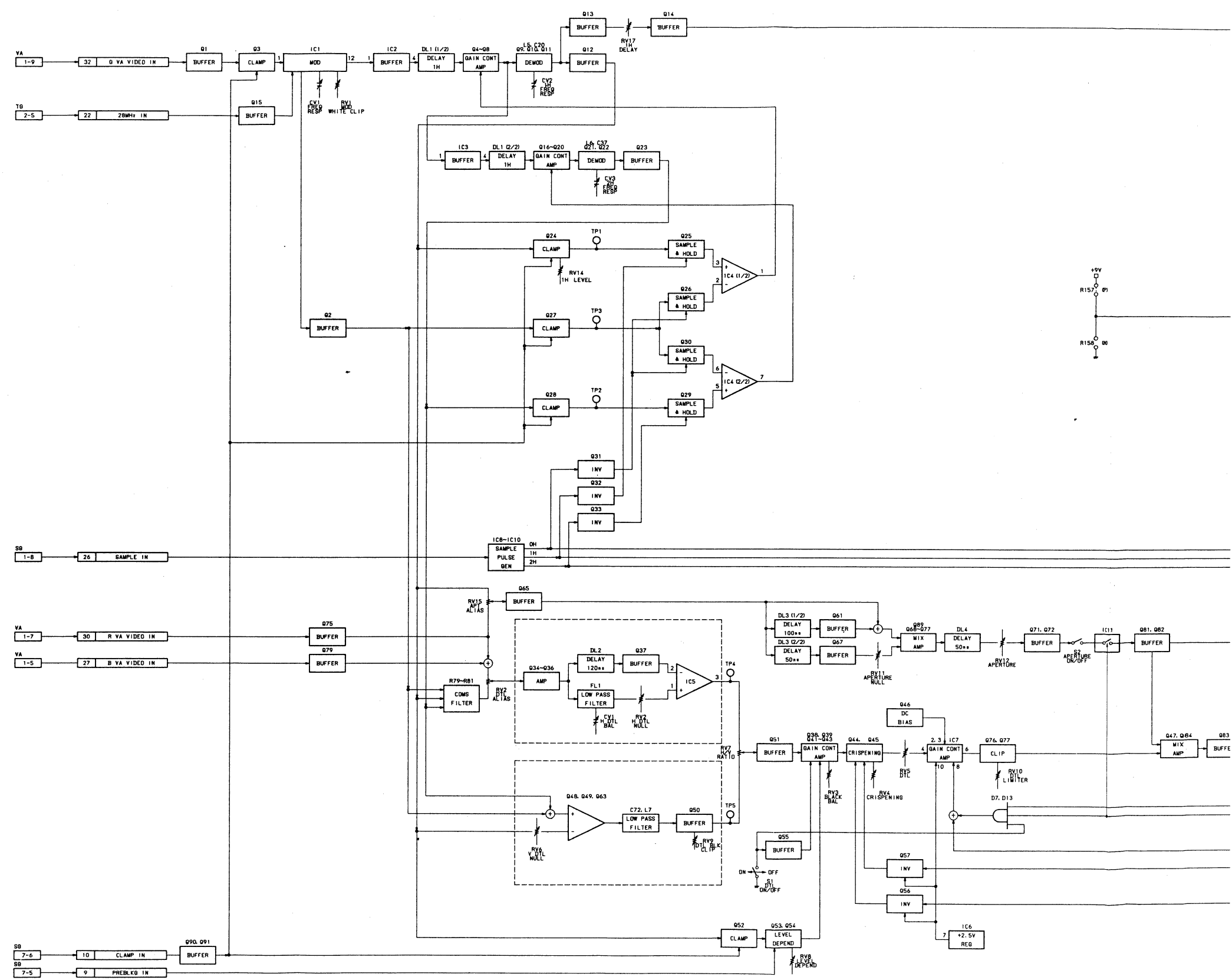
3

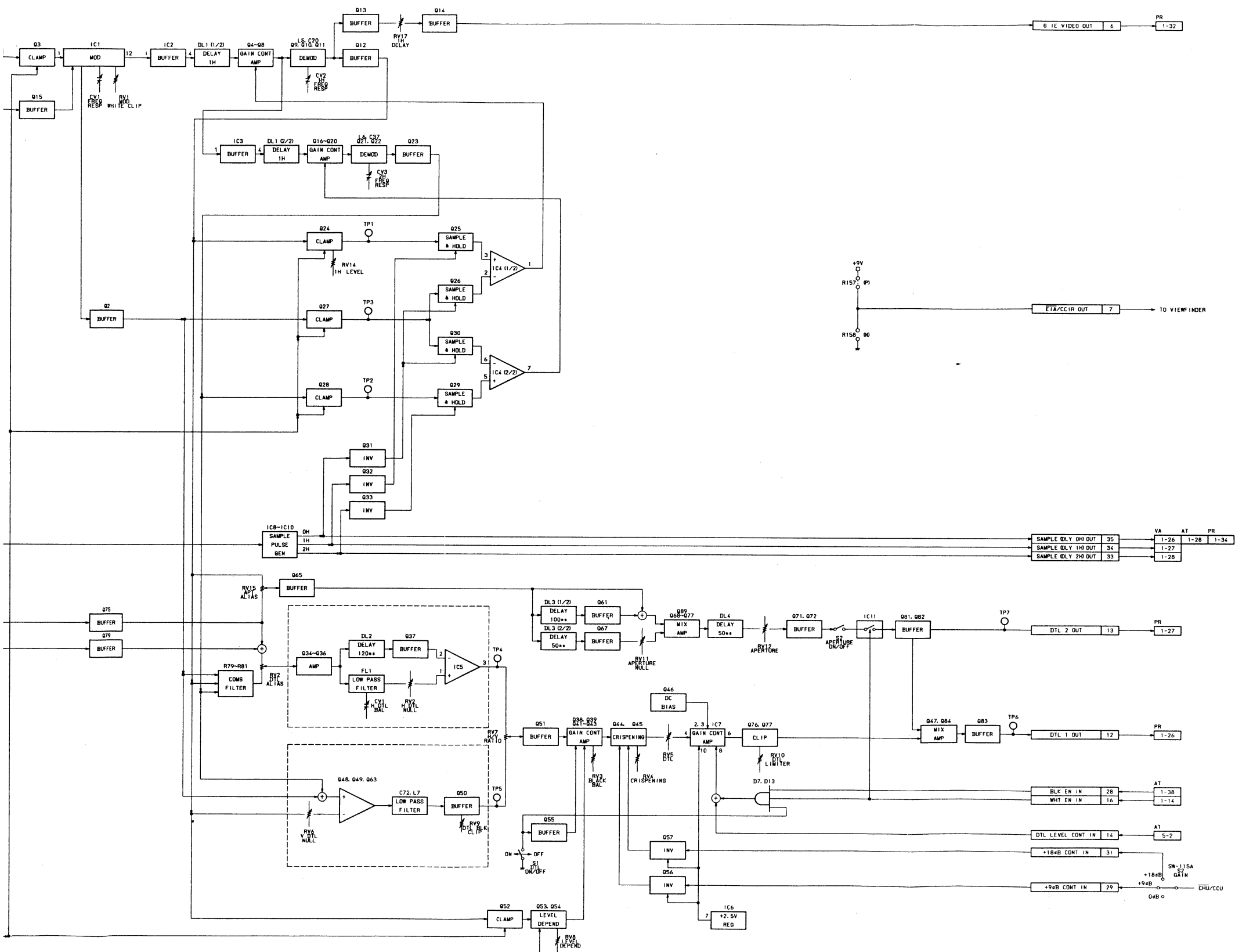
4

5

6

IE-25A/25AP BLOCK



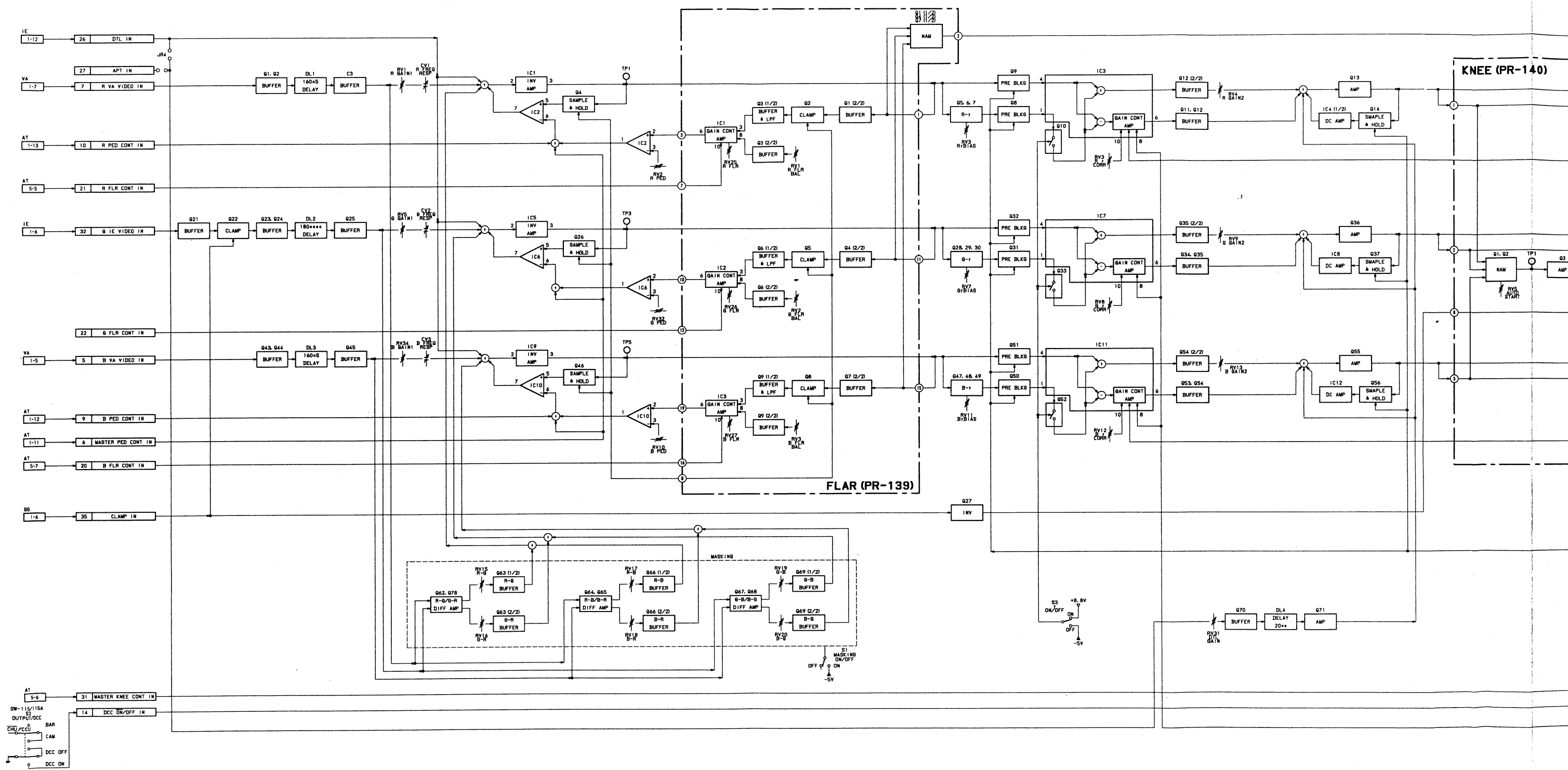


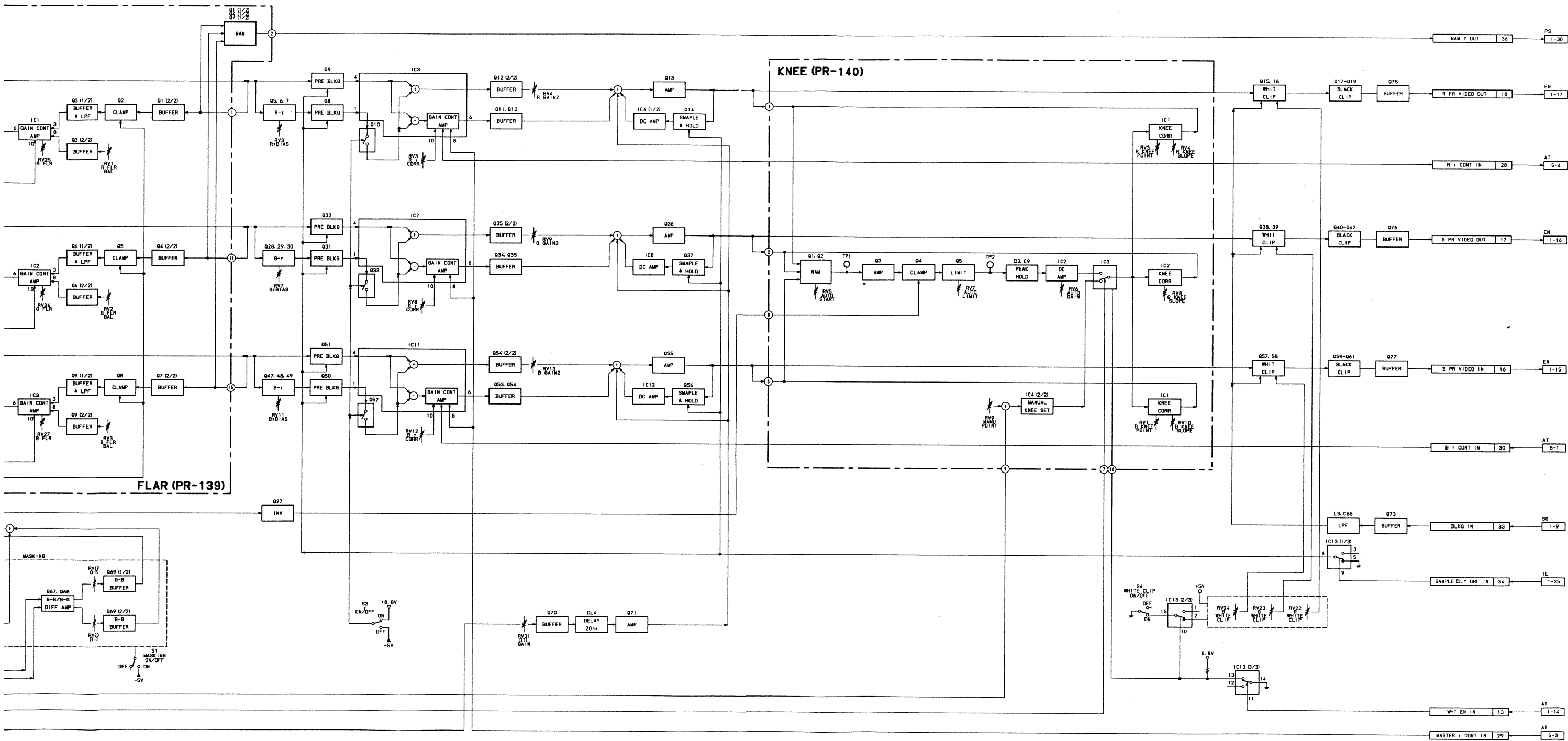
A-13

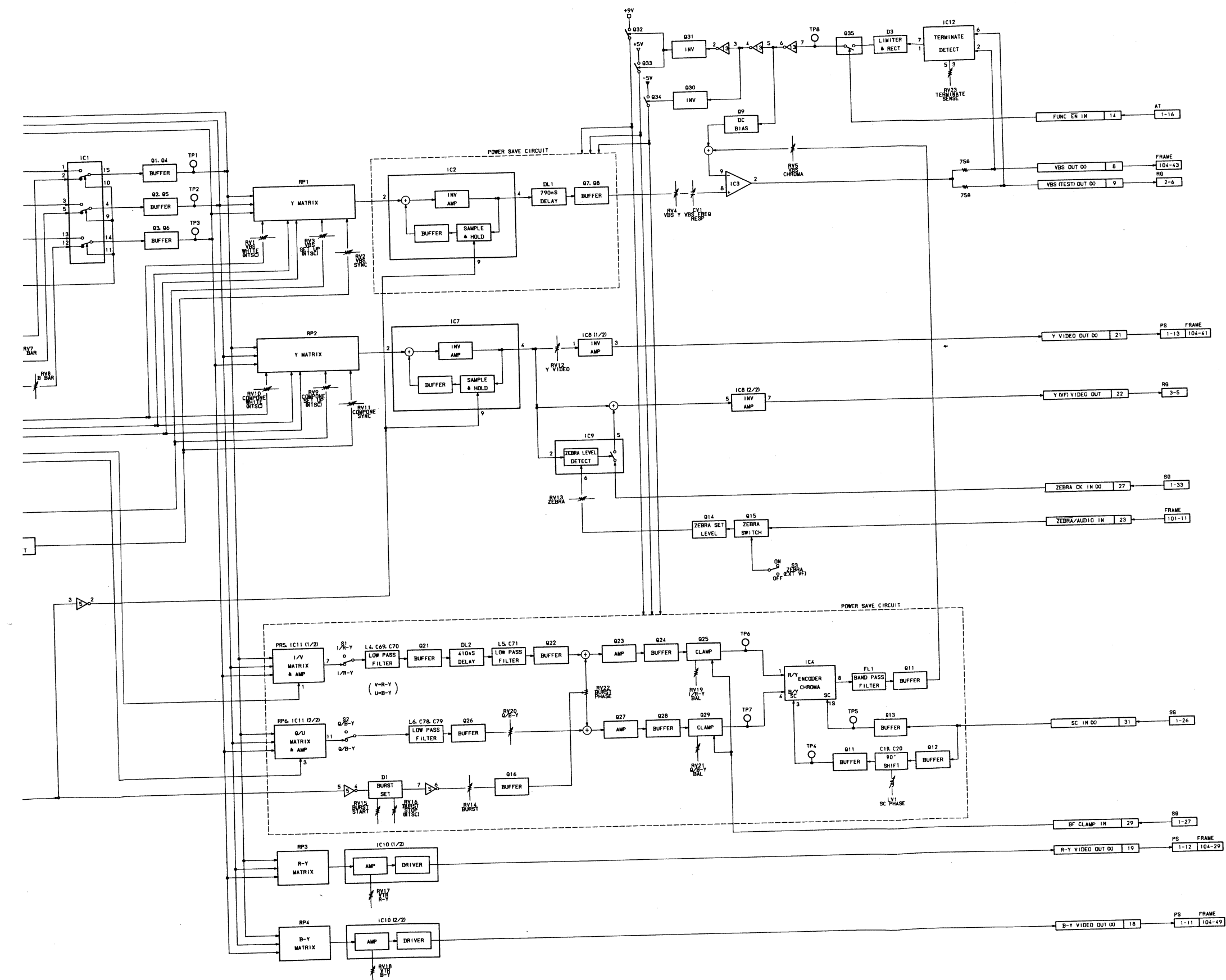
A-14

BVP-7AP (J, UC)
BVP-7AP (EK)
BVP-70IS (J, UC)
BVP-70ISP (EK)
B-BVP70-IE25B LOCK

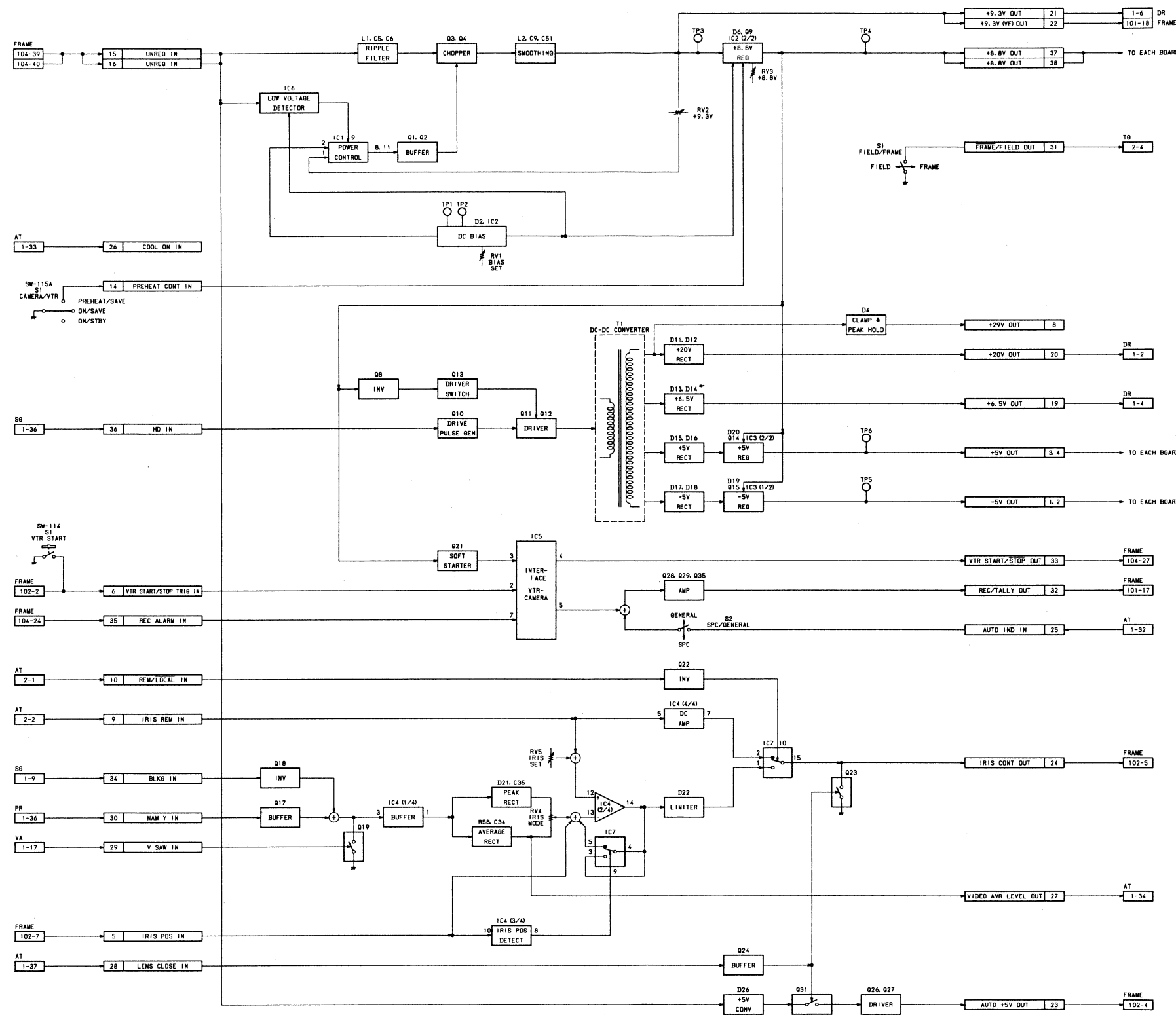
PR-138 BLOCK







PS-173 BLOCK



BVP-7 (J, UC)
BVP-7P (EK)
BVP-7A (J, UC)
BVP-7AP (EK)
BVP-7000HS (J, UC)
BVP-7000HSP (EK)
B-BVP7-PS173BLOCK|SIEDS

A-21

A-22

A

B

C

D

E

F

1

2

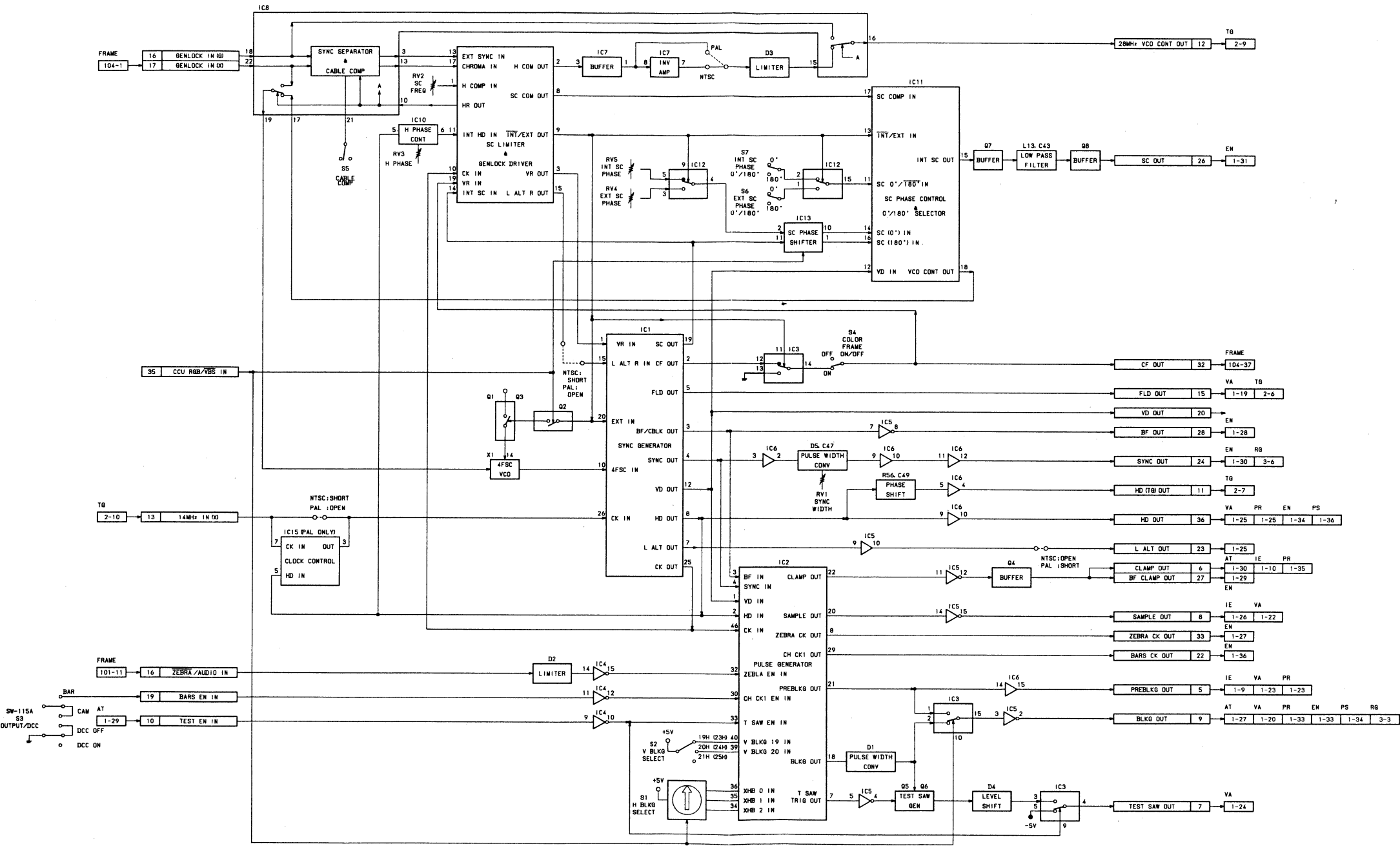
3

4

5

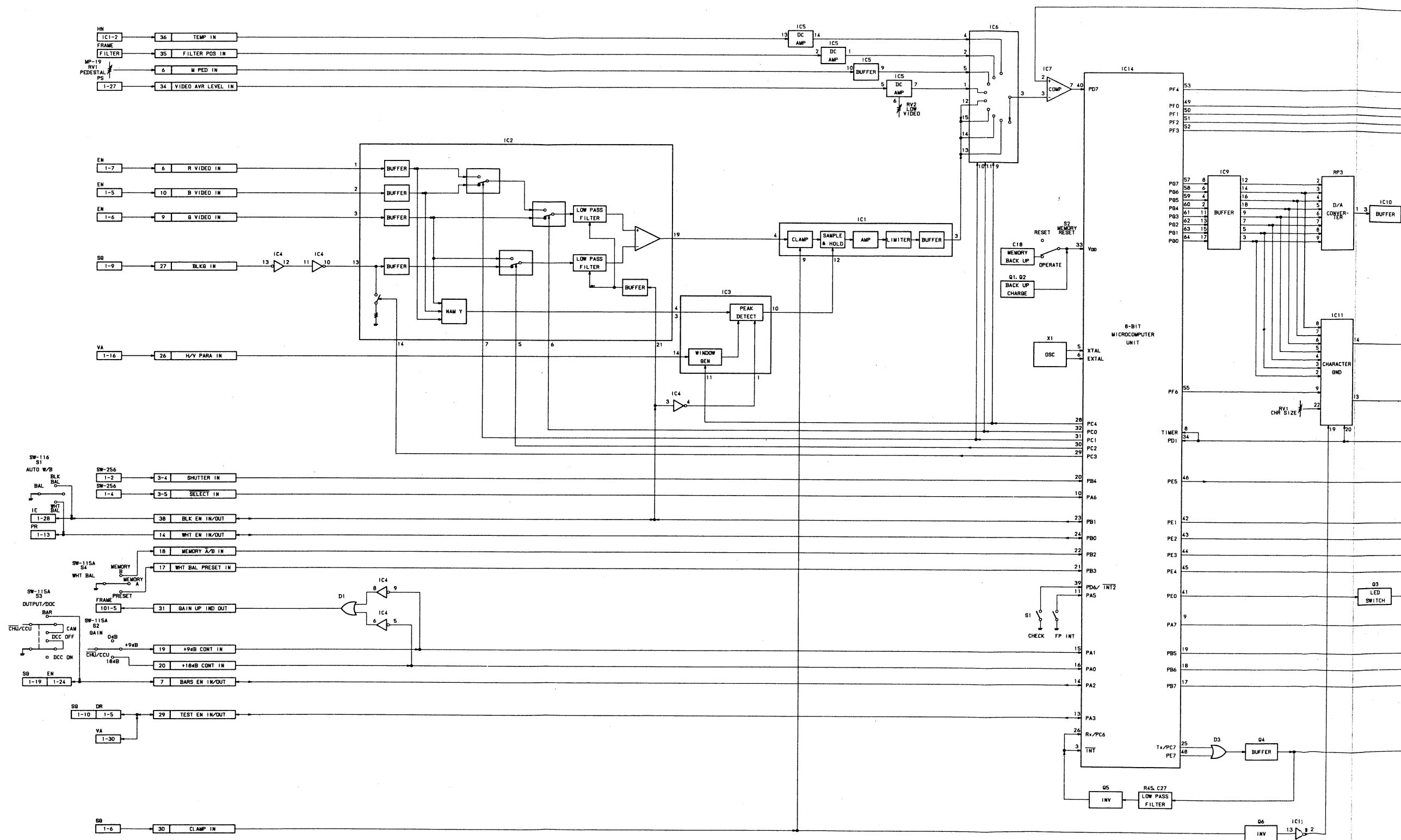
6

SG-143/143P BLOCK



BVP-7 (J, UC)
BVP-7P (EK)
BVP-7A (J, UC)
BVP-7AP (EK)
BVP-7000HS (J, UC)
BVP-7000HSP (EK)
SIEDSIB-BVP7-SG143BLOCK

AT-52A BLOCK



BVP-7 (J, UC)
 BVP-7P (EK)
 BVP-7A (J, UC)
 BVP-7AP (EK)
 BVP-7000HS (J, UC)
 BVP-7000HSP (EK)
 B-BVP7-AT52ABLOCK|SIEDS

A-25

A-26

B

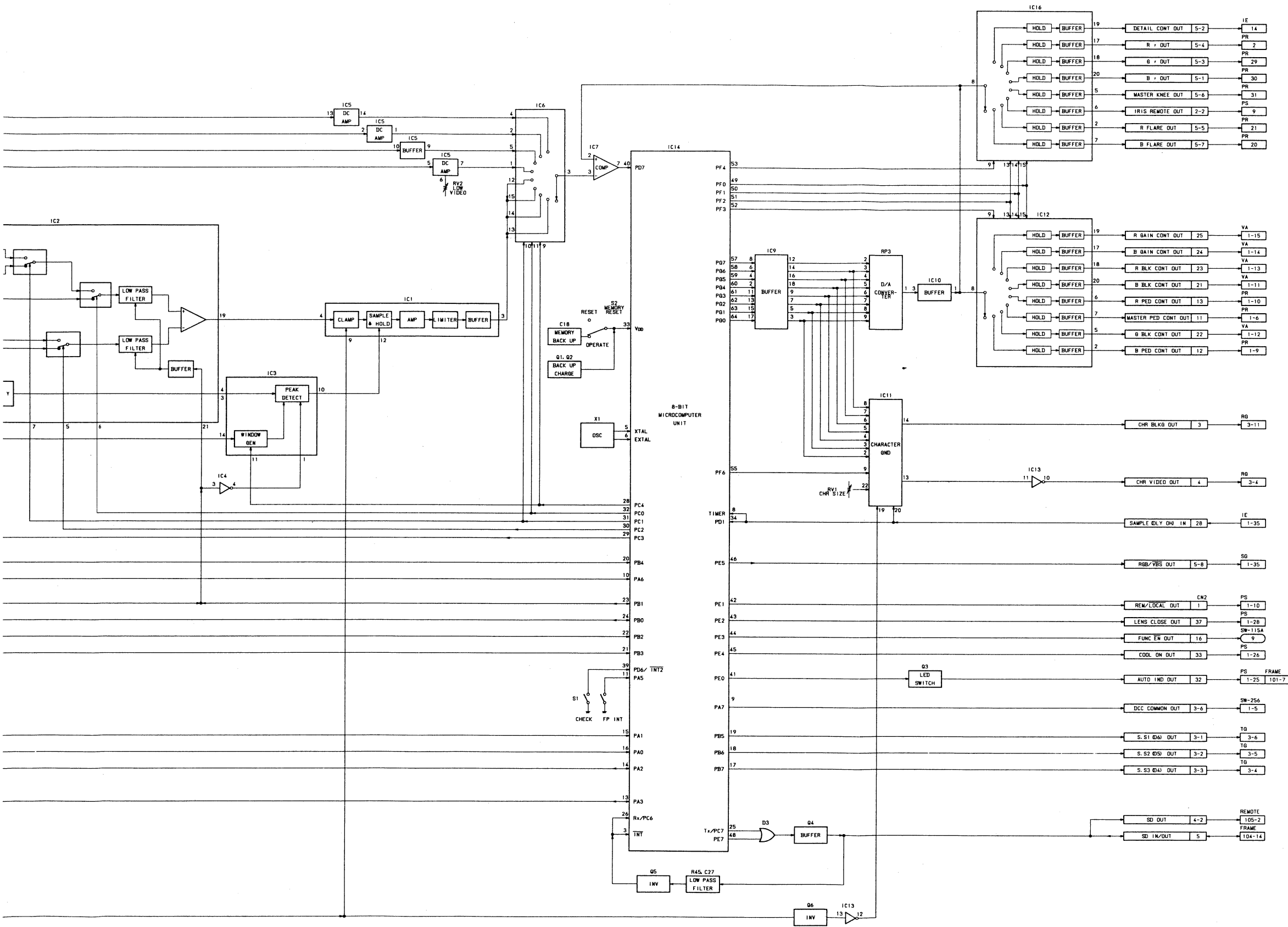
C

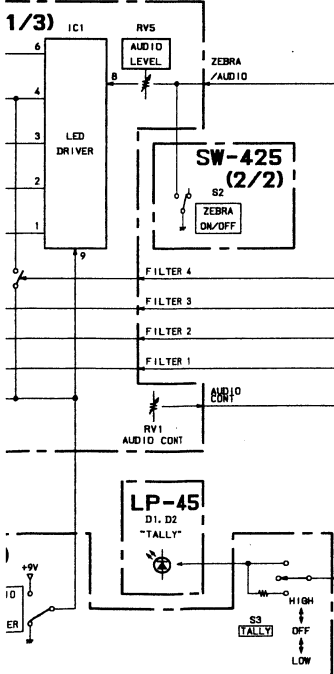
D

E

F

G





SIEDS B-BVP7-VIEWFINDER/BLOCK

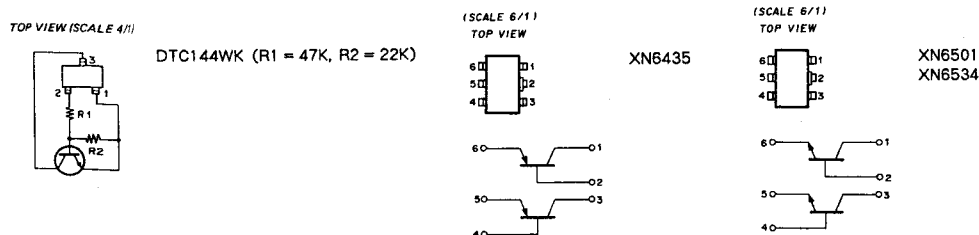
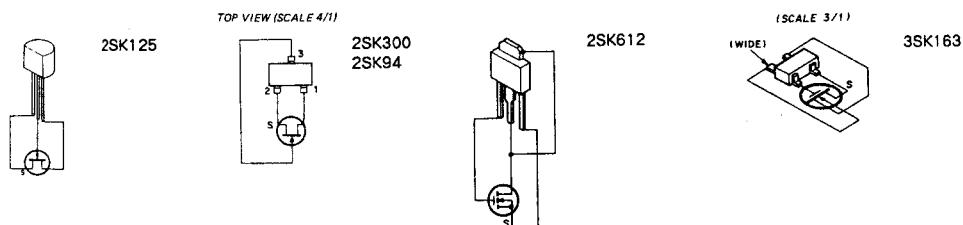
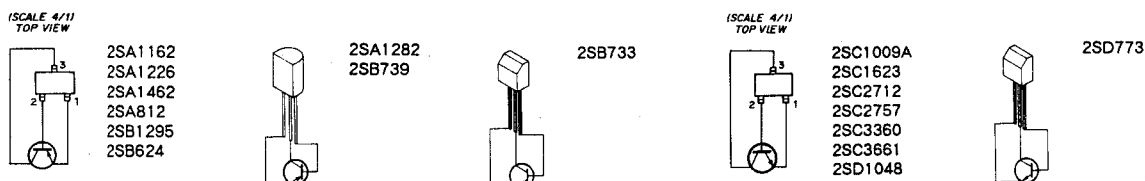
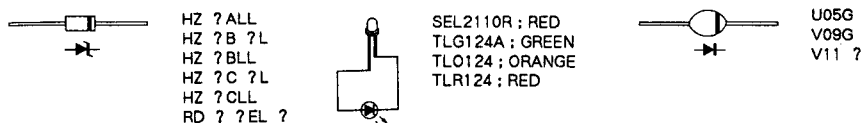
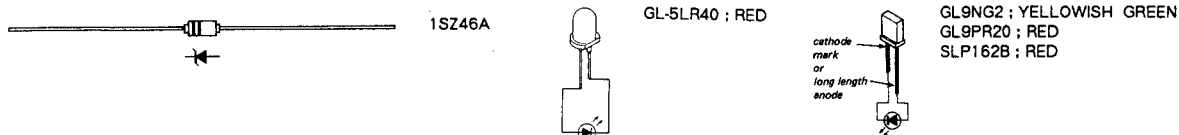
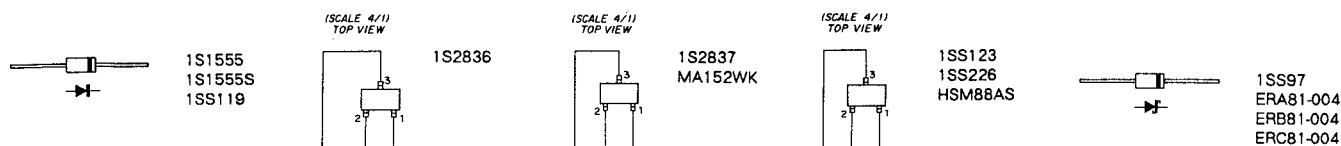
SECTION B

SEMICONDUCTOR

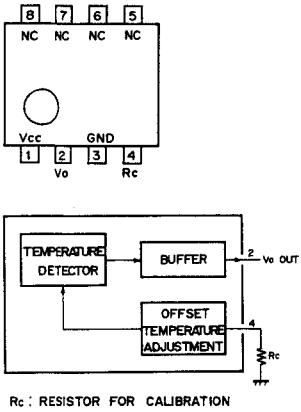
The circuit diagram of IC is obtained from the IC data book published by the manufacturer.

TYPE	PAGE	TYPE	PAGE	TYPE	PAGE
1S1555S.....	B-2	ERC81-004.....	B-2	TC4S01F	B-13
1S1555.....	B-2	GL9PR20 ; RED	B-2	TC4S11F	B-13
1S2836.....	B-2	GL-5LR40.....	B-2	TC4S66F	B-13
1S2837.....	B-2	GL-9NG2.....	B-2	TC4S69F	B-13
1SS119.....	B-2	HA11423MP.....	B-9	TC4S81F	B-13
1SS123.....	B-2	HD6305Y0P	B-9	TC50H001F.....	B-13
1SS226.....	B-2	HSM88AS	B-2	TC74HC4053AF	B-14
1SS97.....	B-2	HZ ? ALL.....	B-2	TC74HC4538AF	B-14
1SZ46A.....	B-2	HZ ? B ? L.....	B-2	TL032CPS	B-14
2SA1162	B-2	HZ ? BLL.....	B-2	TL062CPS	B-14
2SA1226	B-2	HZ ? C ? L.....	B-2	TL064CNS.....	B-14
2SA1282	B-2	HZ ? CLL.....	B-2	TL494CNS.....	B-14
2SA1462	B-2	LB1423N	B-10	TL7700CPS.....	B-15
2SA812.....	B-2	LM2903M	B-10	TLC27L2CPS	B-15
2SB1295	B-2	LM2904M	B-10	TLG124A ; GREEN	B-2
2SB624.....	B-2	LM35DZ	B-10	TLO124 ; ORANGE.....	B-2
2SB733.....	B-2	MA152WK.....	B-2	TLR124 ; RED	B-2
2SB739.....	B-2	MB7114LPF	B-10	U05G	B-2
2SC1009A	B-2	MC14011BF	B-10	UPC311G2.....	B-15
2SC1623	B-2	MC14051BF	B-10	UPC358G2.....	B-15
2SC2712	B-2	MC14053BF	B-11	V09G	B-2
2SC2757	B-2	MC14069UBF.....	B-11	V11 ?.....	B-2
2SC3360	B-2	MC14161BF	B-11	XN6435	B-2
2SC3661	B-2	MC74HC4050F.....	B-11	XN6501	B-2
2SD1048	B-2	MN1237AD	B-11	XN6534	B-2
2SD773.....	B-2	OP-07DPS.....	B-12		
2SK125.....	B-2	RC1496M.....	B-12		
2SK300.....	B-2	RD ? ? EL ?.....	B-2		
2SK612.....	B-2	SBX1588	B-12		
2SK94.....	B-2	SBX1649	B-12		
3SK163.....	B-2	SEL2110R ; RED	B-2		
AN6701S	B-3	SLP162B ; RED	B-2		
BX1179A	B-3	SN74HC4066NS	B-12		
BX1356.....	B-3	TC4011BF	B-10		
CX22017	B-3	TC4049BF	B-12		
CX518.....	B-3	TC4051BFHB	B-10		
CX7930A	B-4	TC4053BFHB	B-11		
CX7968A	B-6	TC4069UBF.....	B-11		
CX7969.....	B-6	TC40H241F.....	B-12		
CXA1065M	B-8	TC4538BF	B-13		
CXD1361M	B-8				
CXD8154M	B-8				
DTC144WK	B-2				
ERA81-004	B-2				
ERB81-004.....	B-2				

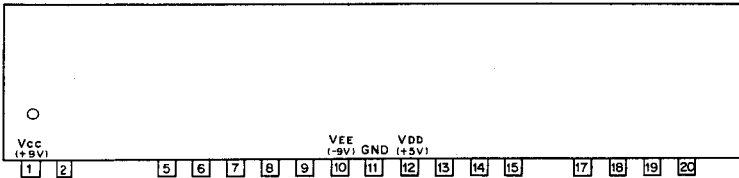
DIODE, TRANSISTOR



AN6701S (MATSUSHITA) FLAT PACKAGE
TEMPERATURE SENSING
- TOP VIEW -

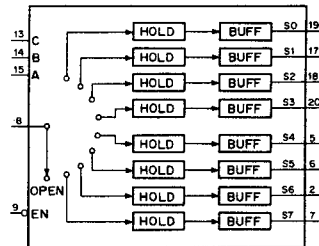


BX1179A (SONY)
8-CHANNEL SELECTABLE SAMPLING HOLDER
- PRINTED SIDE -

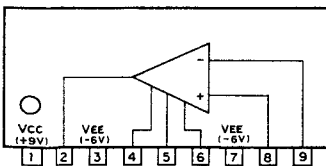


EN	C	B	A	"ON" CHANNEL
0	0	0	0	S0
0	0	0	1	S1
0	0	1	0	S2
0	0	1	1	S3
0	1	0	0	S4
0	1	0	1	S5
0	1	1	0	S6
0	1	1	1	S7
1	X	X	X	OPEN

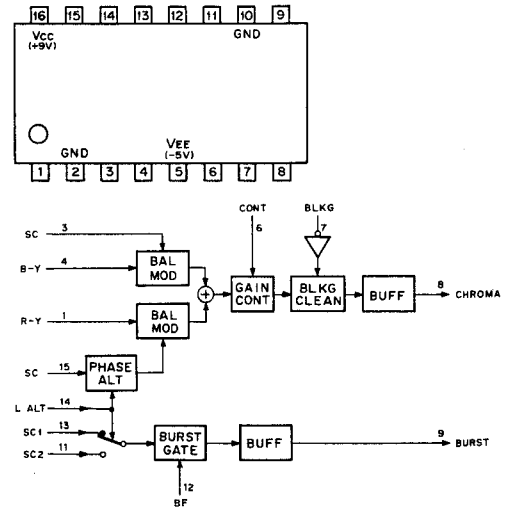
0: LOW LEVEL
1: HIGH LEVEL
X: DON'T CARE



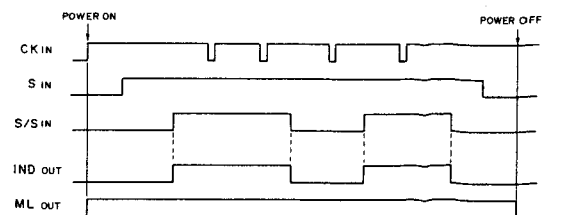
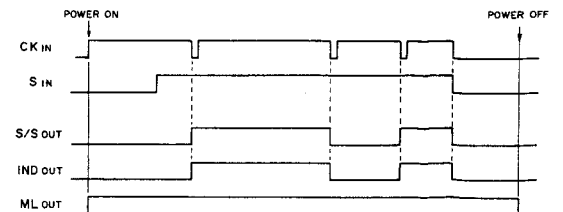
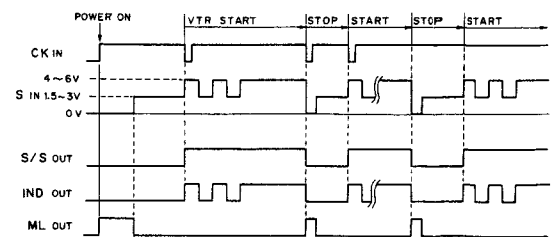
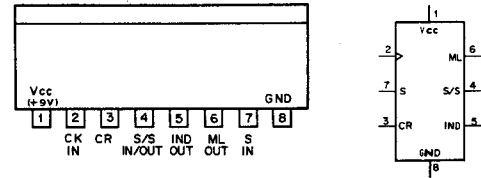
BX1356 (SONY)
VIDEO OUTPUT AMPLIFIER
- PRINTED SIDE -



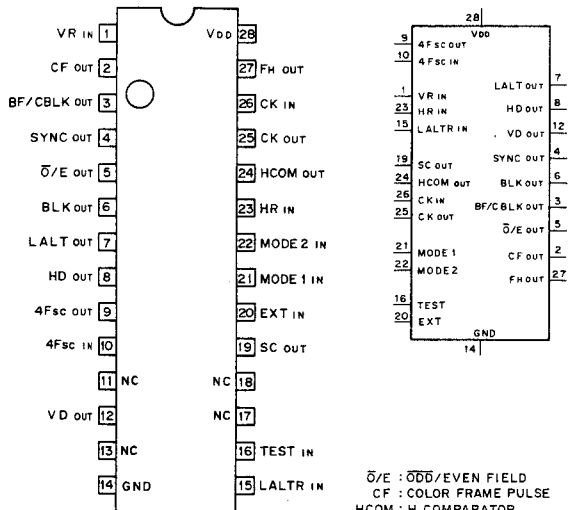
CX22017 (SONY)
VIDEO SIGNAL PROCESSOR
- TOP VIEW -



CX518 (SONY)
INTERFACE CIRCUIT BETWEEN VTR AND CAMERA
- SIDE VIEW -



CX7930A (SONY) ($V_{DD} = +5V$) FLAT PACKAGE
 CMOS SYNC GENERATOR (NTSC, PAL-M, PAL, SECAM)
 - TOP VIEW -

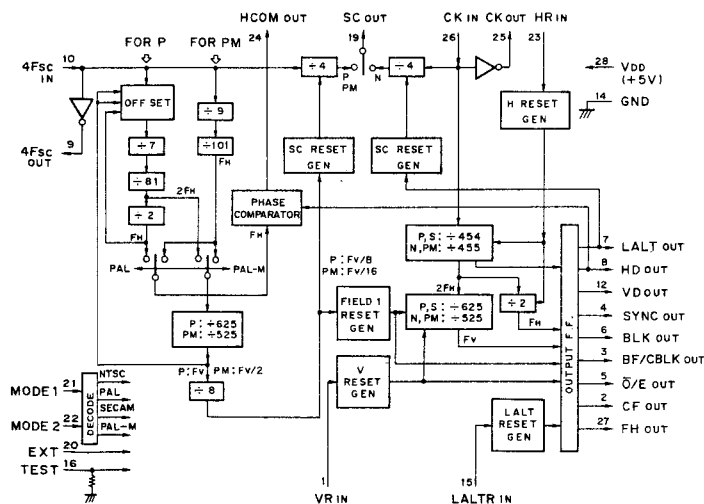
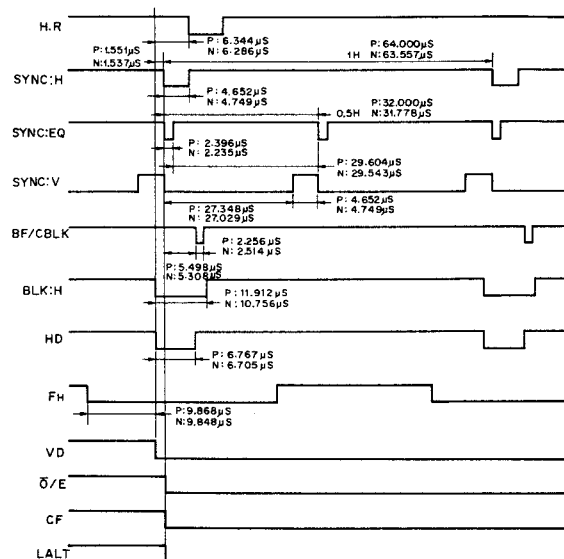


SYSTEM	4Fsc	CLOCK	MODE 1	MODE 2	SYSTEM	EXT	TEST	FUNCTION
NTSC	910 Fh	910 Fh	0	0	NTSC	0	0	INTERNAL
PAL	1135 Fh + 2 Fv	908 Fh	0	1	SECAM	0	1	INVALID
PALM	909 Fh	910 Fh	1	0	PALM	1	0	EXT
SECAM		908 Fh	1	1	PAL	1	1	TEST

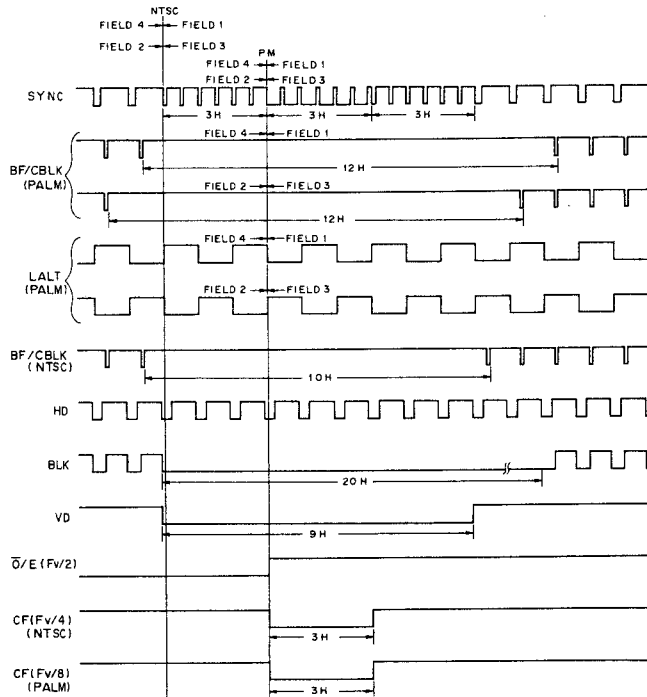
0 : LOW LEVEL (GND)
 1 : HIGH LEVEL (V_{DD})

TEST '0': OPEN
 (INTERNALLY
 PULLED DOWN)

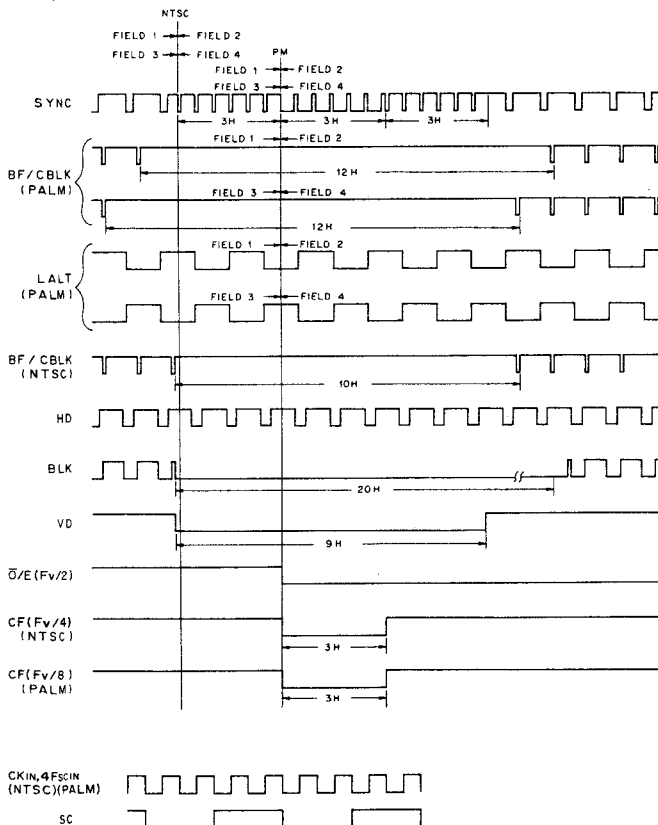
P: PAL, SECAM
 N: NTSC, PALM



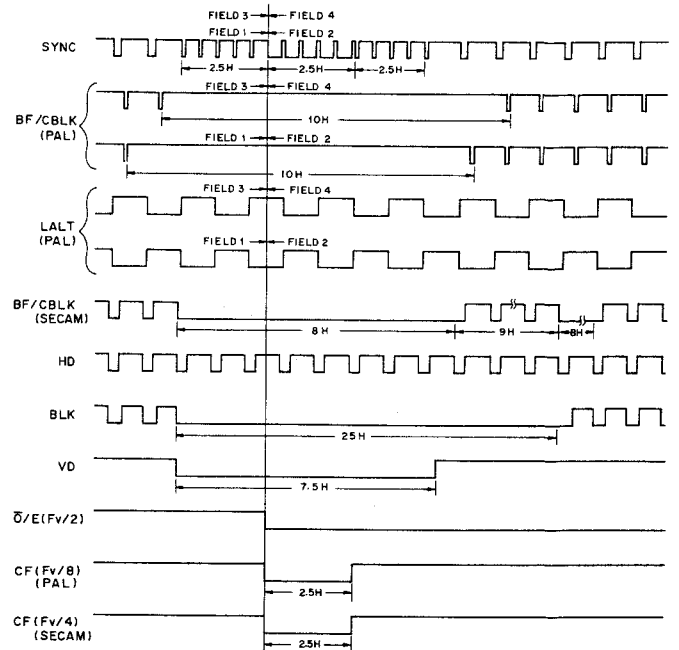
NTSC, PAL-M (FIELD 1,3)



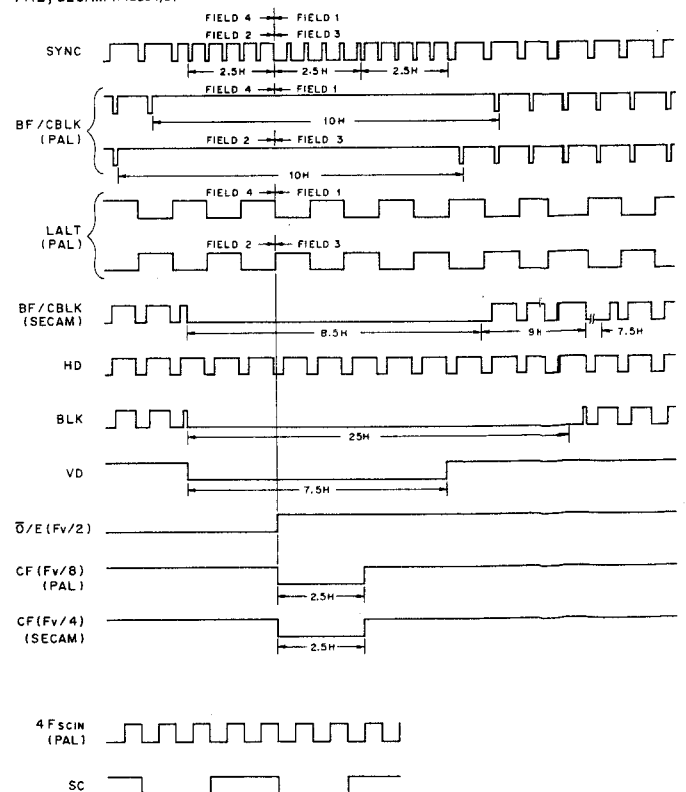
NTSC, PAL-M (FIELD 2,4)



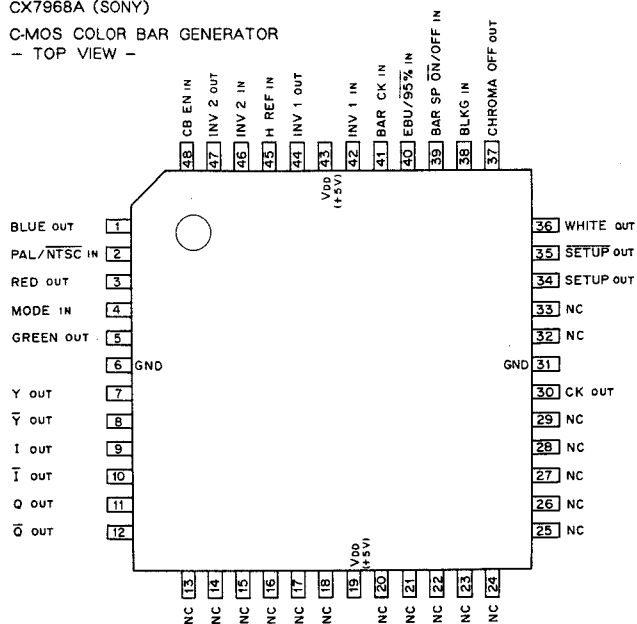
PAL, SECAM (FIELD 4,2)



PAL, SECAM (FIELD 1,3)

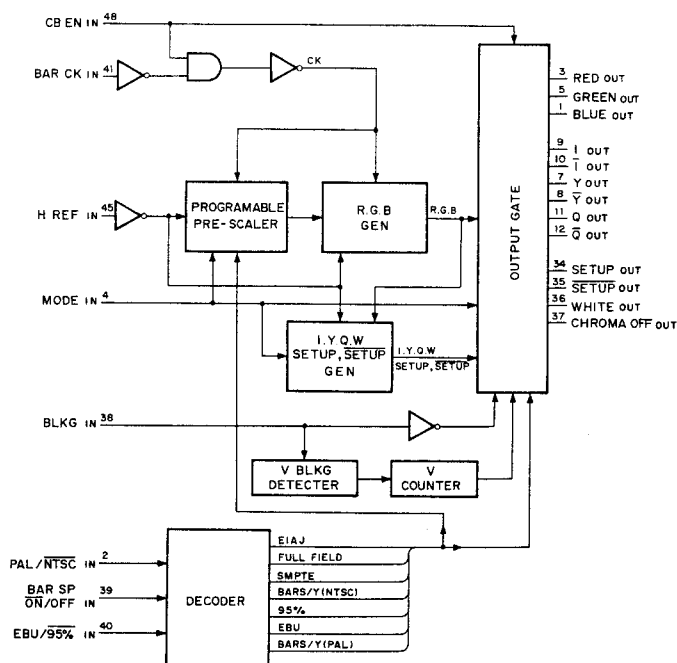


CX7968A (SONY)

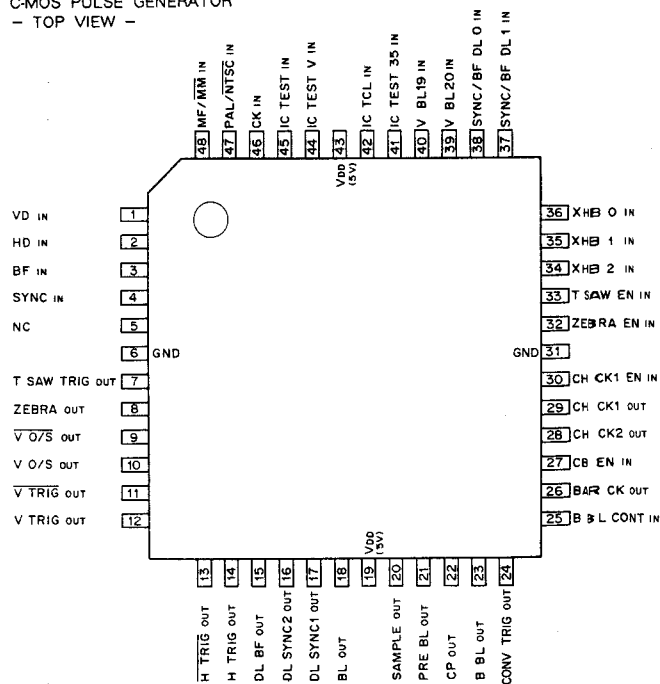
CMOS COLOR BAR GENERATOR
- TOP VIEW -

INPUT				FUNCTION
PAL/NTSC	MODE	EBU/95%	BAR SP	
0	0	0	0	EIAJ COLOR BAR
0	0	0	1	FULL FIELD COLOR BAR
0	0	1	0	INHIBIT
0	0	1	1	INHIBIT
0	1	0	0	EIAJ COLOR BAR
0	1	0	1	FULL FIELD COLOR BAR
0	1	1	0	SMPTE COLOR BAR
0	1	1	1	COLOR BAR + Y BAR
1	0	0	0	95% COLOR BAR
1	0	0	1	INHIBIT
1	0	1	0	EBU COLOR BAR
1	0	1	1	INHIBIT
1	1	0	0	95% COLOR BAR
1	1	0	1	COLOR BAR + Y BAR
1	1	1	0	EBU COLOR BAR
1	1	1	1	INHIBIT

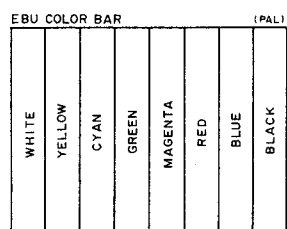
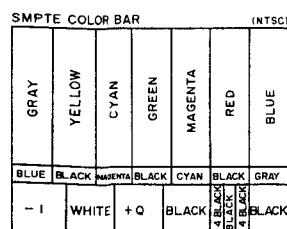
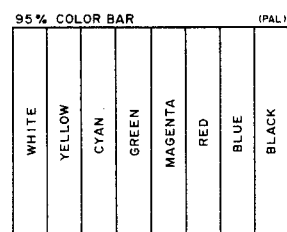
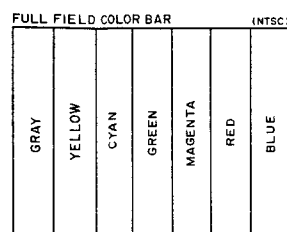
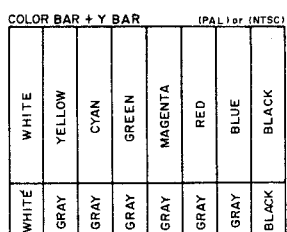
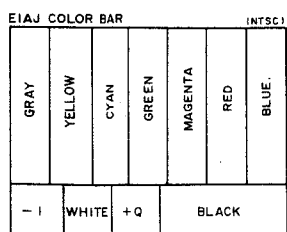
0: LOW LEVEL
1: HIGH LEVEL



CX7969 (SONY)

CMOS PULSE GENERATOR
- TOP VIEW -

O COLOR BAR PATTERN



1. SYSTEM DESIGNATION

INPUT	SYSTEM
PAL/NTSC IN	
1	PAL, SECAM
0	NTSC, PALM

2. TYPE OF TUBE

INPUT	FUNCTION
MF/MM IN	
1	MAG-STA TUBE
0	MAG-MAG TUBE

3. V BLKG WIDTH (NTSC ONLY)

INPUT	V BLKG WIDTH
V BL 19	
1	19H
0	20H
0	21H

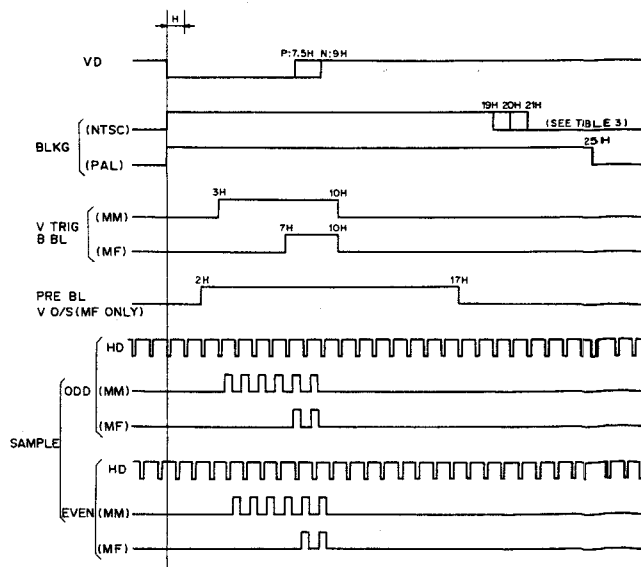
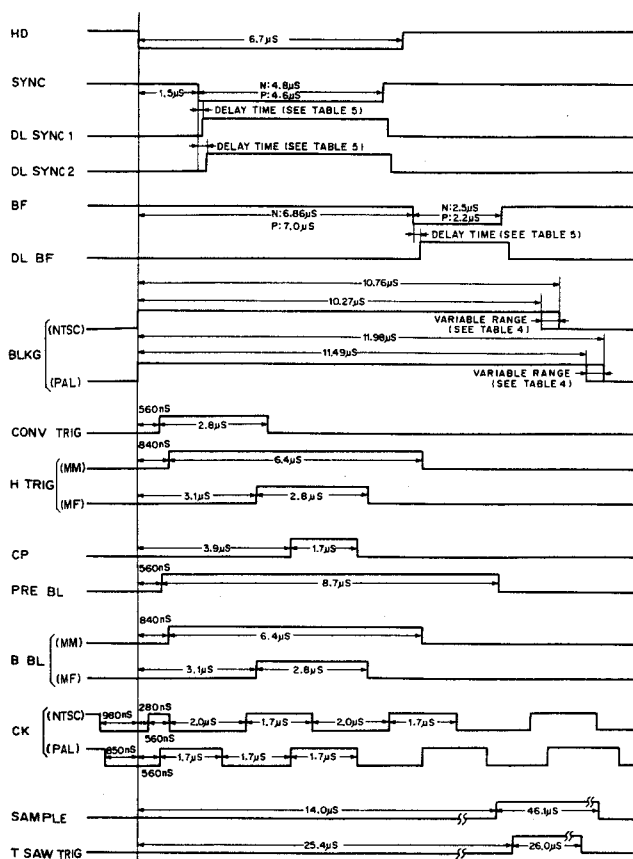
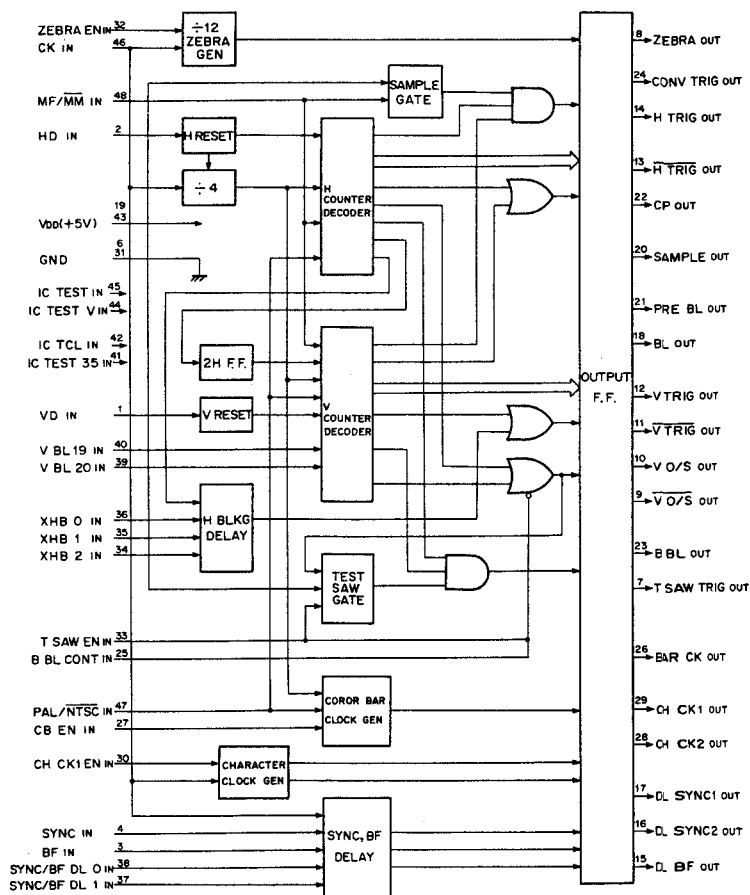
4. H BLKG WIDTH

INPUT			BLKG WIDTH (μS)	
XHB2	XHB1	XHB0	NTSC	PAL
1	1	1	10.27	11.49
1	1	0	10.34	11.56
1	0	1	10.41	11.63
1	0	0	10.48	11.70
0	1	1	10.55	11.77
0	1	0	10.62	11.84
0	0	1	10.69	11.91
0	0	0	10.76	11.98

5. DELAY TIME

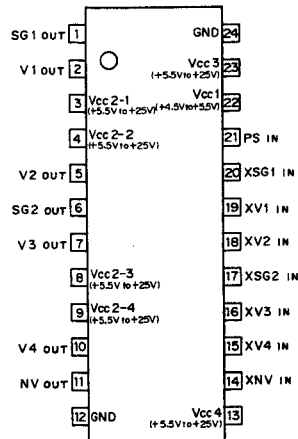
INPUT		DELAY TIME (nS)		
SYNC/BF DL1	SYNC/BF DL2	DL SYNC 1	DL SYNC 2	DL BF
1	1	140	210	140
1	0	210	280	210
0	1	630	700	630
0	0	700	770	700

1; HIGH LEVEL
0; LOW LEVEL
X; DON'T CARE

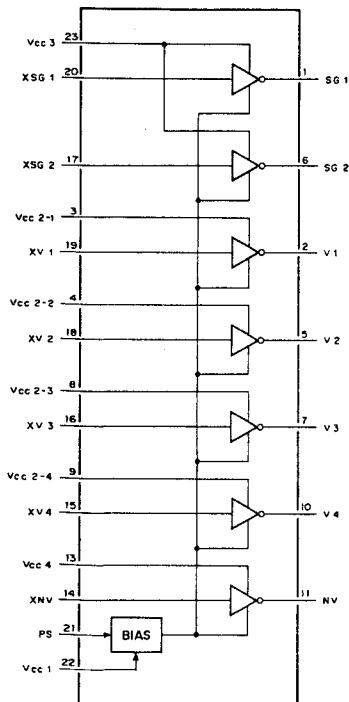


CXA1065M (SONY) FLAT PACKAGE

INVERTING DRIVER FOR CCD CLOCK WITH POWER SAVE
- TOP VIEW -

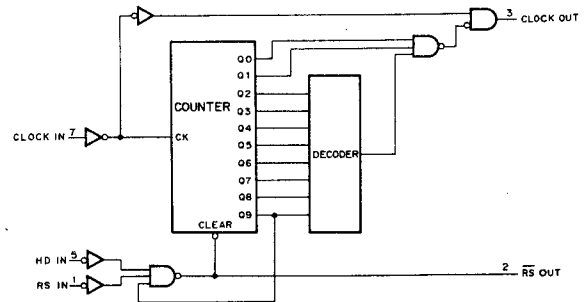
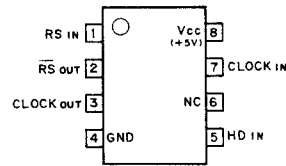


XV1-XV4; VERTICAL REGISTER TRANSMISSION CLOCK INPUT
V1-V4; VERTICAL REGISTER TRANSMISSION CLOCK OUTPUT
XSG1, XSG2; SENSOR GATE PULSE INPUT
SG1, SG2; SENSOR GATE PULSE OUTPUT
XNV; DRIVER INPUT
NV; DRIVER OUTPUT
PS; POWER SAVE INPUT
Vcc 1; BIAS VOLTAGE
Vcc 2-1; V1 OUTPUT PULSE VOLTAGE
Vcc 2-2; V2 OUTPUT PULSE VOLTAGE
Vcc 2-3; V3 OUTPUT PULSE VOLTAGE
Vcc 2-4; V4 OUTPUT PULSE VOLTAGE
Vcc 3; SG1, SG2 OUTPUT PULSE VOLTAGE
Vcc 4; NV OUTPUT PULSE VOLTAGE



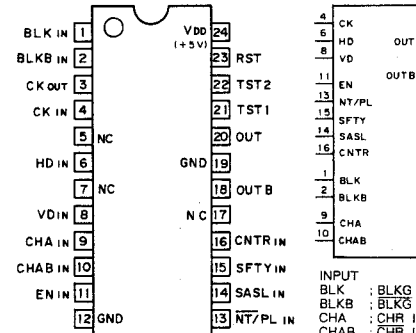
CXD1361M (TI) FLAT PACKAGE

CLOCK CONTROLLER
- TOP VIEW -

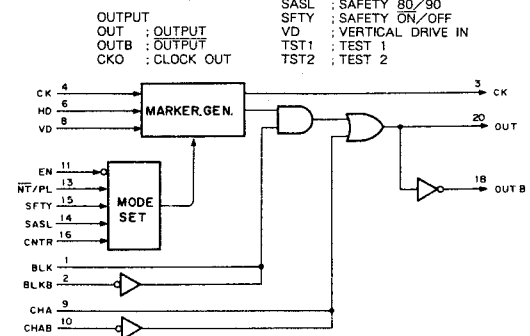


CXD8154M (SONY)

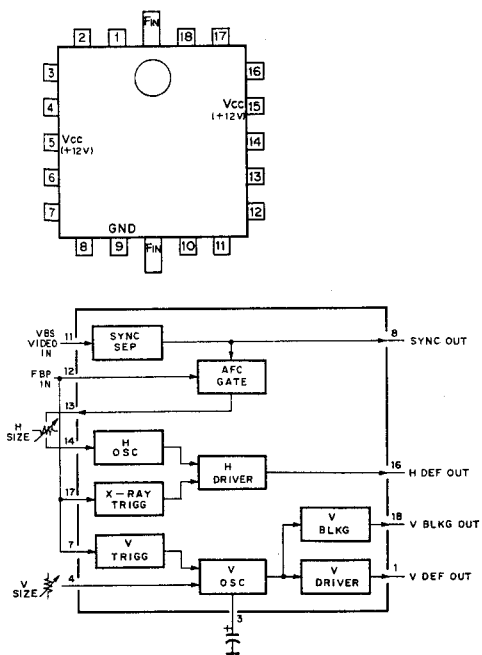
C-MOS GATE ARRAY
- TOP VIEW -



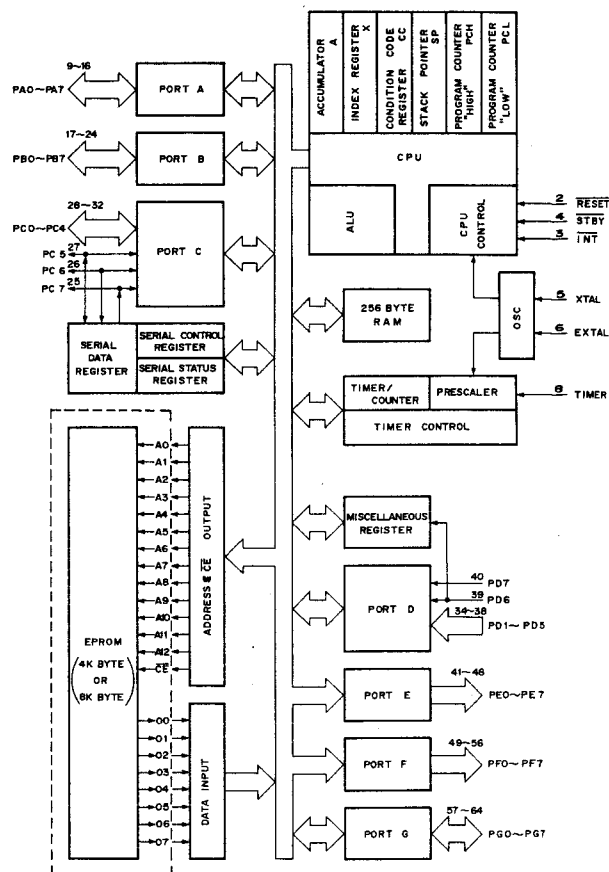
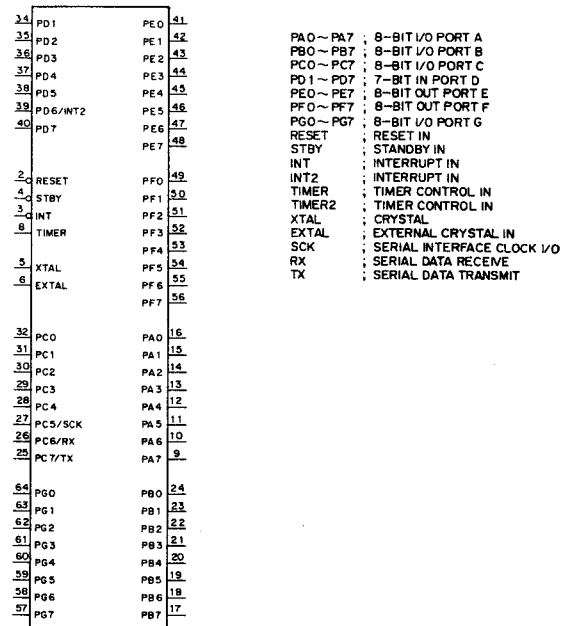
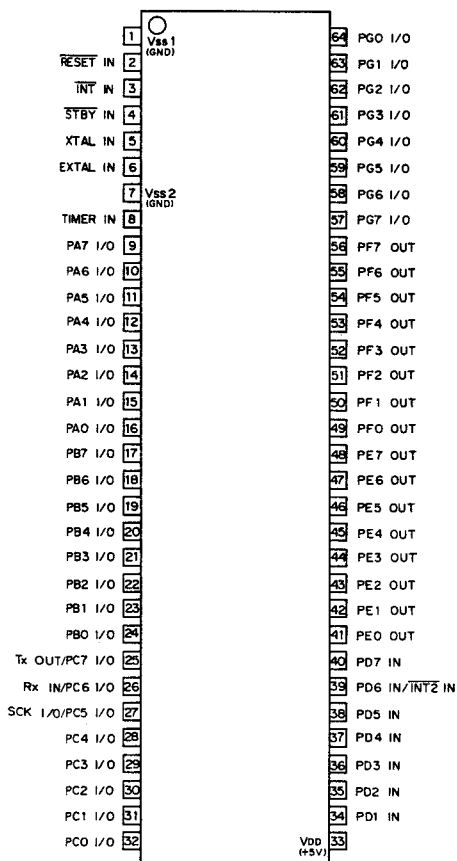
INPUT
BLK : BLKG IN
BLKB : BLKB IN
CHA : CHA IN
CHAB : CHB IN
CK : CLOCK IN
CNTR : CENTER ON/OFF
EN : ENABLE IN
HD : HORIZONTAL DRIVE IN
NT/PL : NTSC/PAL
RST : RESET
SASL : SAFETY 80/90
SFTY : SAFETY ON/OFF
VD : VERTICAL DRIVE IN
TST1 : TEST 1
TST2 : TEST 2



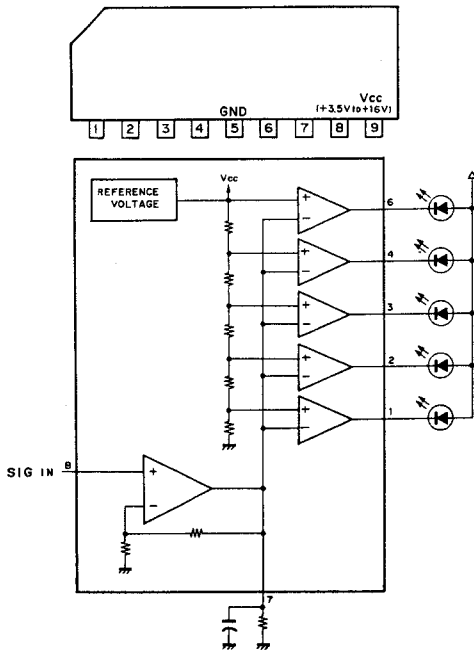
HA11423MP (HITACHI) FLAT PACKAGE
TV H/V SYNC SIGNAL PROCESSOR
- TOP VIEW -



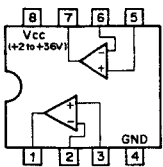
HD6305Y0P (HITACHI) (INSTRUCTION CYCLE = 1 μ S ; f_{α} = 4MHz)
C-MOS 8-BIT MICROPROCESSOR UNIT
- TOP VIEW -



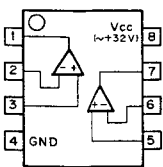
LB1423N (SANYO)
LED DRIVER FOR AC/DC LEVEL METER
- SIDE VIEW -



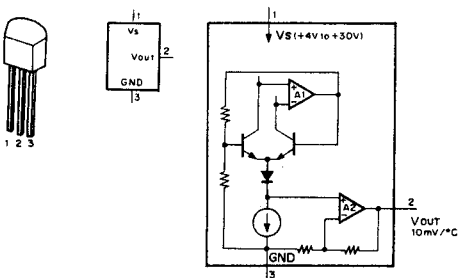
LM2903M (RAYTHEON) FLAT PACKAGE
DUAL VOLTAGE COMPARATORS
- TOP VIEW -



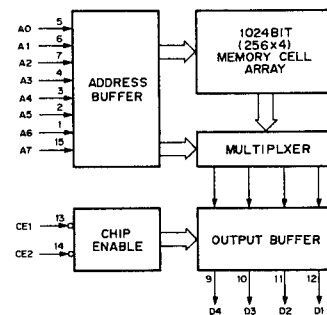
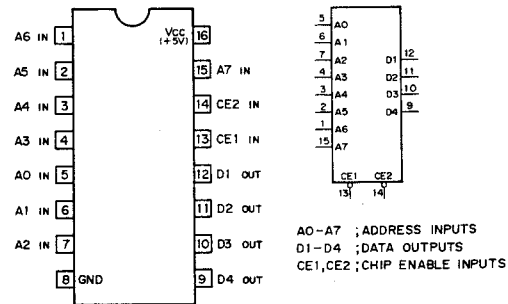
LM2904M (NSC) FLAT PACKAGE
OPERATIONAL AMPLIFIER
- TOP VIEW -



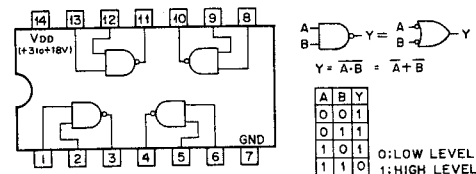
LM35DZ (NS)
BIPOLAR TEMPERATURE SENSOR



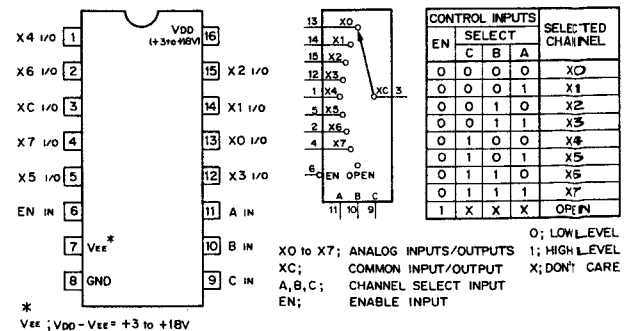
MB7114LPF (FUJITSU) (ACCESS TIME = 50ns) FLAT PACKAGE
TTL 1024-BIT (256x4) PROM
- TOP VIEW -



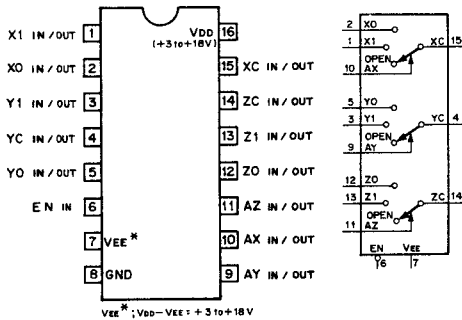
MC14011BF (MOTOROLA) FLAT PACKAGE
TC4011BF (TOSHIBA) FLAT PACKAGE
CMOS 2-INPUT NAND GATE
- TOP VIEW -



MC14051BF (MOTOROLA) FLAT PACKAGE
TC4051BFHB (TOSHIBA) FLAT PACKAGE
CMOS 8-CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER
- TOP VIEW -



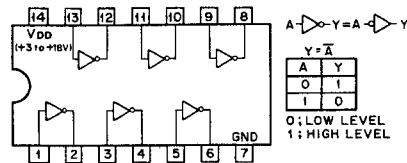
MC14053BF (MOTOROLA) FLAT PACKAGE
TC4053BFHB (TOSHIBA) FLAT PACKAGE
C-MOS TRIPLE 2-CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER
- TOP VIEW -



CONT. INPUTS		ON CHANNEL	
EN	A (X,Y,Z)	0	1
0	0	0	0
0	1	0	1
1	X	0	OPEN

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE.

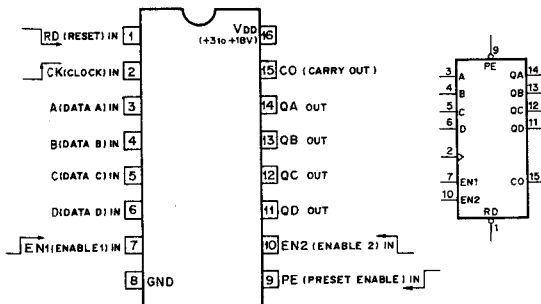
MC14069UBF (MOTOROLA)
TC4069UBF (TOSHIBA) FLAT PACKAGE
C-MOS INVERTER
- TOP VIEW -



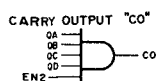
A	Y
0	1
1	0

0; LOW LEVEL
1; HIGH LEVEL

MC14161BF (MOTOROLA) FLAT PACKAGE
C-MOS PRESETTABLE SYNCHRONOUS 4-BIT BINARY COUNTER WITH ASYNCHRONOUS RESET
- TOP VIEW -



MODE SELECTION				MODE
RD	PE	EN1	EN2	
0	X	X	X	RESET (ASYNCHRONOUS)
1	0	X	X	PRESET (SYNCHRONOUS)
1	1	0	X	NO COUNT
1	1	X	0	NO COUNT
1	1	1	1	COUNT

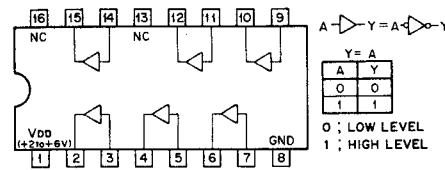


CO IS HIGH WHEN EN2 INPUT IS HIGH AND COUNT IS 15.

COUNT	OUTPUTS			
	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

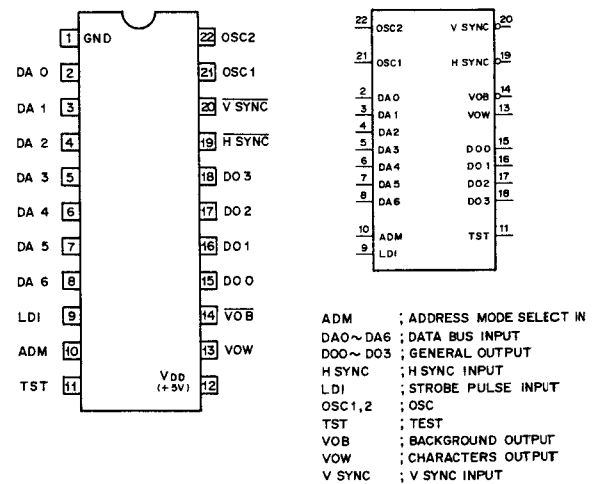
MC74HC4050F (MOTOROLA) FLAT PACKAGE
C-MOS NON-INVERTING TYPE BUFFER/CONVERTER
- TOP VIEW -



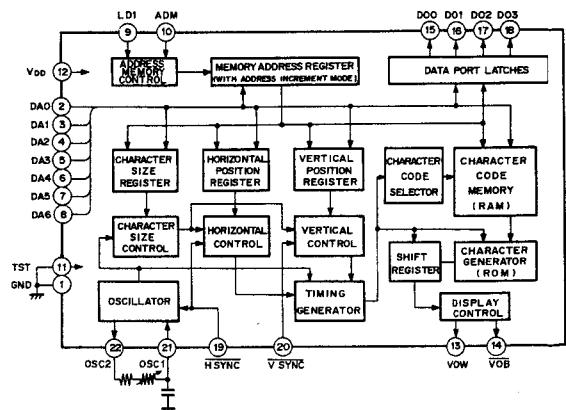
A	Y
0	0
1	1

0; LOW LEVEL
1; HIGH LEVEL

MN1237AD (MATSUSHITA)
C-MOS INDICATES DATA OF 80 CHARACTERS CRT INTERFACE
- TOP VIEW -

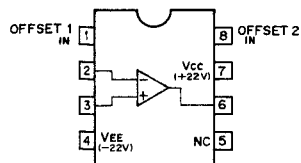


ADM : ADDRESS MODE SELECT IN
DA0~DA6 : DATA BUS INPUT
DOO~DO3 : GENERAL OUTPUT
H SYNC : H SYNC INPUT
LD1 : STROBE PULSE INPUT
OSC1,2 : OSC
TST : TEST
VOB : BACKGROUND OUTPUT
VOW : CHARACTERS OUTPUT
V SYNC : V SYNC INPUT

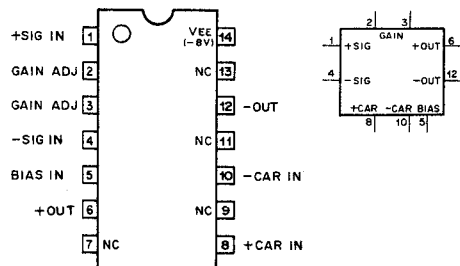


A B C D E F G H I J
K L M N O P Q R S T
U V W X Y Z
0 1 2 3 4 5 6 7 8 9
. : . - ? / □ □

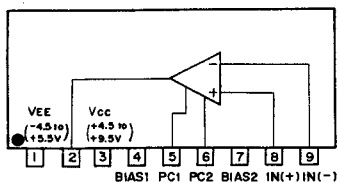
OP-07DPS (TI) FLAT PACKAGE
OPERATIONAL AMPLIFIER
- TOP VIEW -



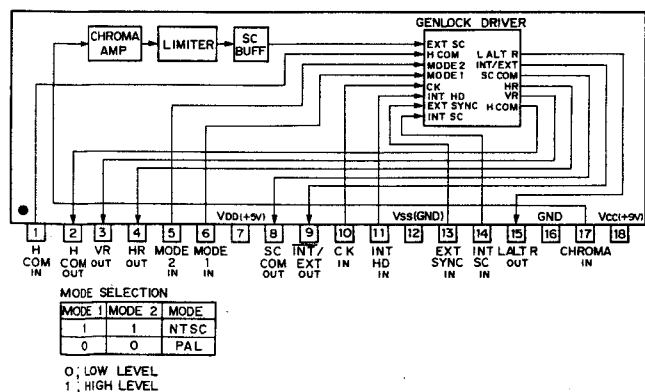
RC1496M (RAYTHEON) FLAT PACKAGE
BALANCED MODULATOR/DEMODULATOR
- TOP VIEW -



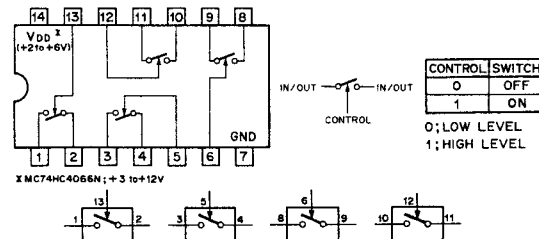
SBX1588 (SONY)
VIDEO AMPLIFIER
- SIDE VIEW -



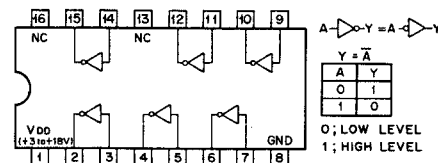
SBX1649 (SONY)
SC LIMITER AND GENLOCK DRIVER
- REAR VIEW -



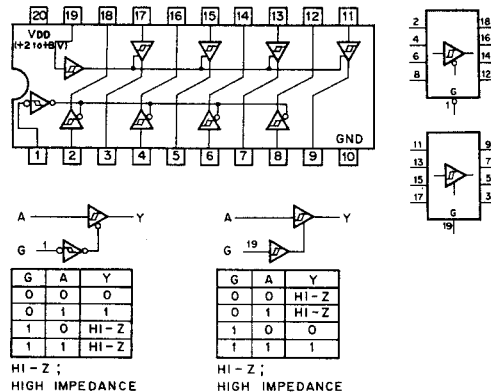
SN74HC4066NS (TI) FLAT PACKAGE
C-MOS BILATERAL ANALOG SWITCH
- TOP VIEW -



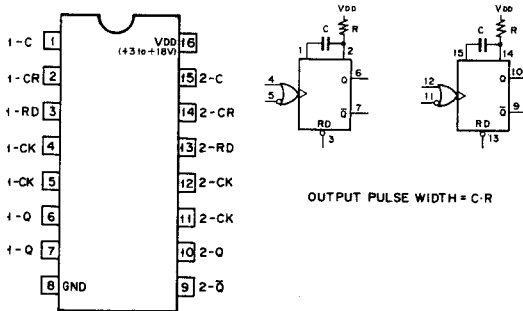
TC4049BF (TOSHIBA) FLAT PACKAGE
C-MOS INVERTING TYPE BUFFER/CONVERTER
- TOP VIEW -



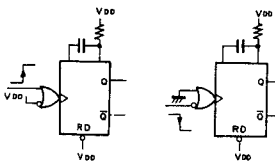
TC40H241F (TOSHIBA) FLAT PACKAGE
C-MOS 3-STATE SCHMITT TRIGGER BUFFER/LINE DRIVER
- TOP VIEW -



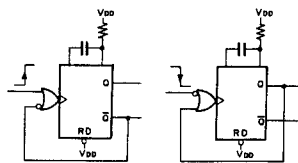
TC4538BF (TOSHIBA) FLAT PACKAGE

C-MOS DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR
- TOP VIEW -

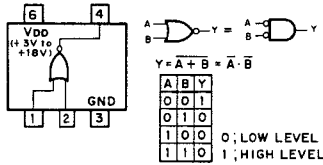
RETRIGGERABLE M.M.V.



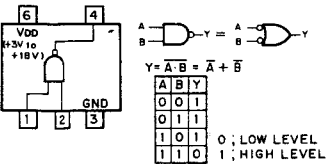
NON-RETRIGGERABLE M.M.V.



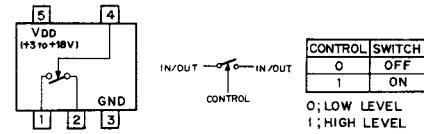
TC4S01F (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT NOR GATE
- TOP VIEW -

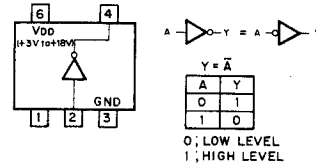
TC4S11F (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT NAND GATE
- TOP VIEW -

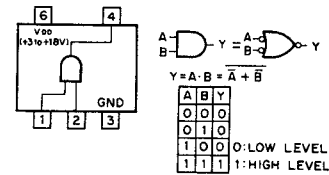
TC4S66F (TOSHIBA)

C-MOS BILATERAL ANALOG SWITCH
- TOP VIEW -

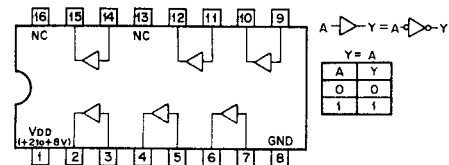
TC4S69F (TOSHIBA) FLAT PACKAGE

C-MOS INVERTER BUFFER
- TOP VIEW -

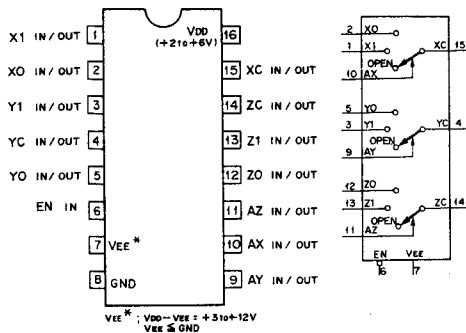
TC4S81F (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT AND GATE
- TOP VIEW -

TC50H001F (TOSHIBA) FLAT PACKAGE

C-MOS NON-INVERTING TYPE BUFFER/CONVERTER
- TOP VIEW -

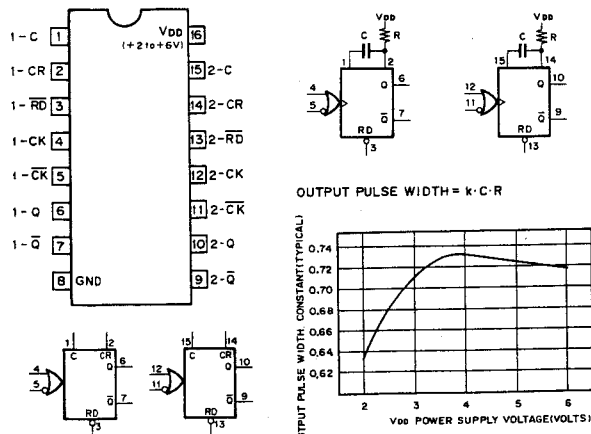
TC74HC4053AF (TOSHIBA) FLAT PACKAGE

C-MOS TRIPLE 2-CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER
- TOP VIEW -

CONT. INPUTS	ON CHANNEL
EN	A (X,Y,Z)
0	0
1	1
X	OPEN

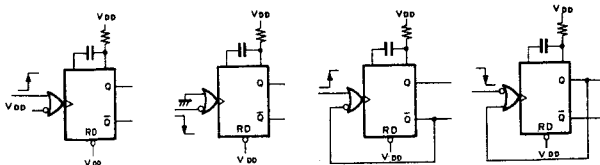
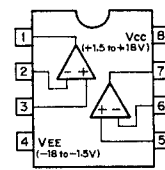
0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE.

TC74HC4538AF (TOSHIBA) FLAT PACKAGE

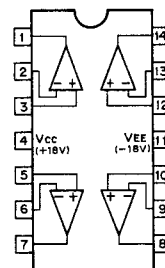
C-MOS DUAL RETRIGGERABLE / NON-RETRIGGERABLE MONOSTABLE MULTIVIBRATOR
- TOP VIEW -

RETRIGGERABLE M.M.V

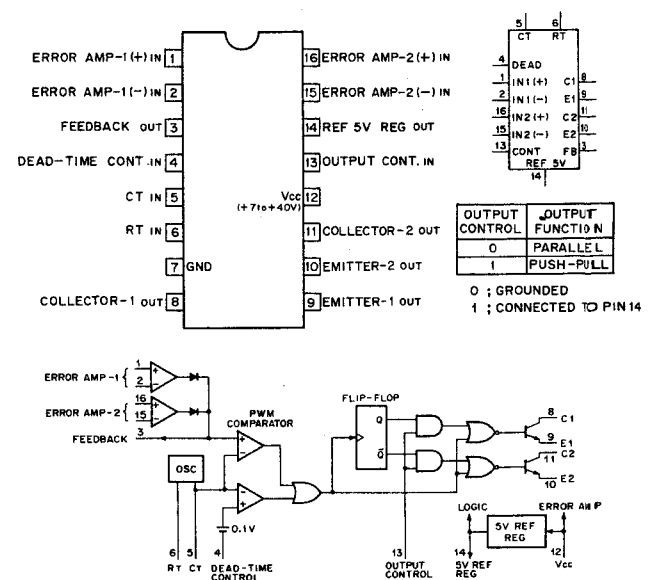
NON-RETRIGGERABLE M.M.V

TL032CPS (TI) FLAT PACKAGE
TL062CPS (TI) FLAT PACKAGEOPERATIONAL AMPLIFIER
(JFET INPUT)
- TOP VIEW -

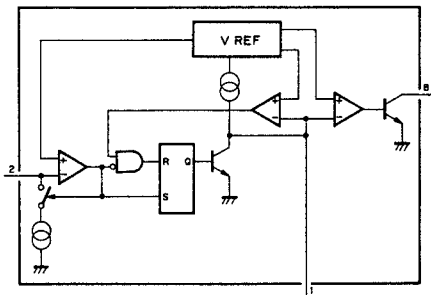
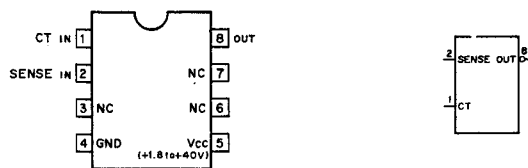
TL064CNS (TI) FLAT PACKAGE

OPERATIONAL AMPLIFIER
(J FET-INPUT)
- TOP VIEW -

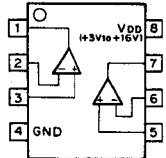
TL494CNS (TI) FLAT PACKAGE

PWM POWER CONTROL
- TOP VIEW -

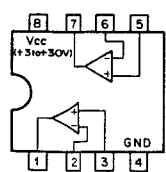
TL7700CPS (TI) FLAT PACKAGE
VARIABLE SUPPLY VOLTAGE SUPERVISOR
- TOP VIEW -



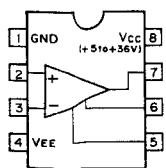
TLC27L2CPS (TI) FLAT PACKAGE
OPERATIONAL AMPLIFIER
- TOP VIEW -



UPC358G2 (NEC) FLAT PACKAGE
DUAL OPERATIONAL AMPLIFIERS
- TOP VIEW -



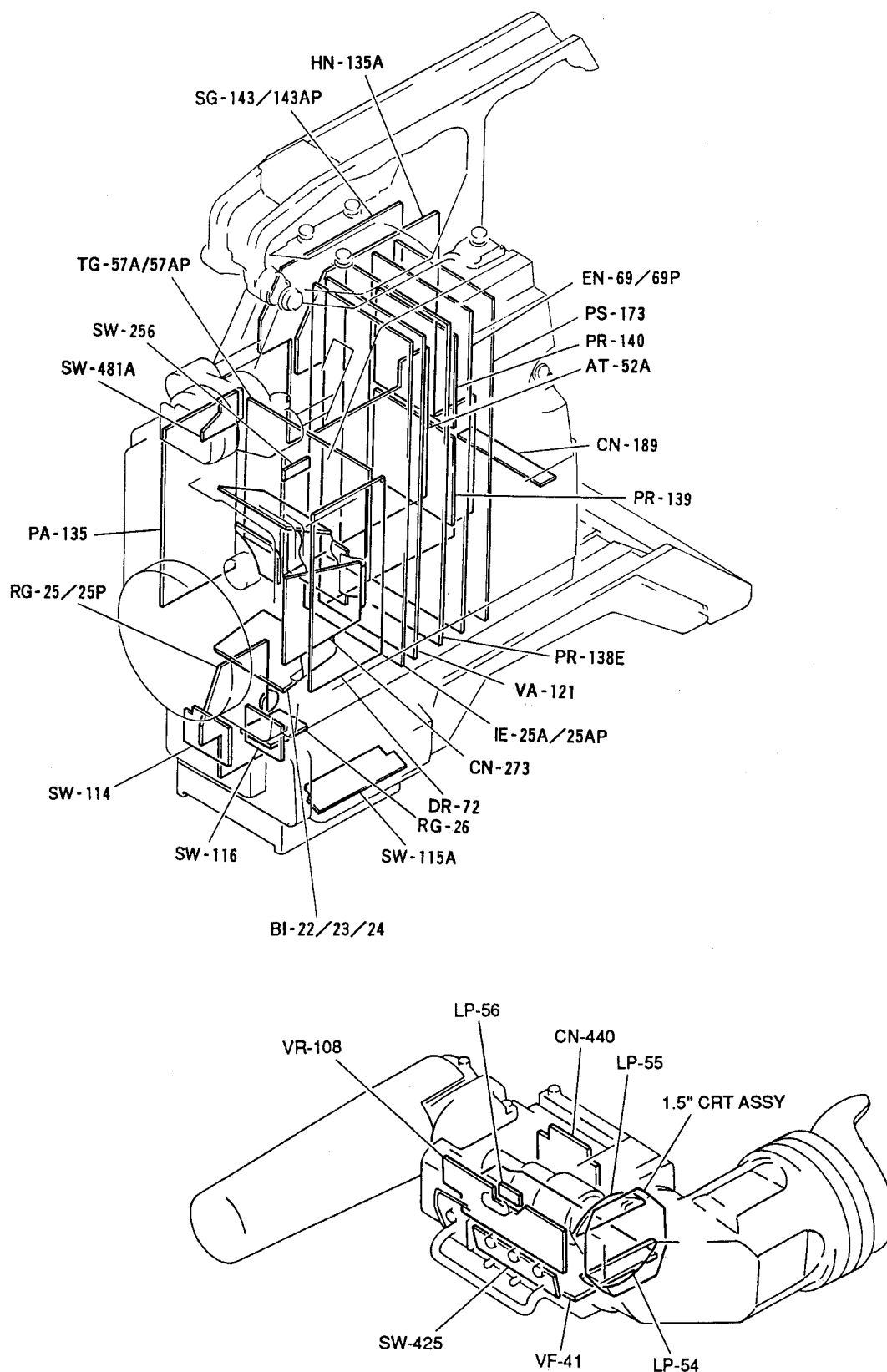
UPC311G2 (NEC) FLAT PACKAGE
VOLTAGE COMPARATOR
- TOP VIEW -



SECTION C

SCHEMATIC DIAGRAMS AND BOARD ILLUSTRATIONS

BOARD LAYOUT



BVP-7A (J, UC)
BVP-7AP (EK)

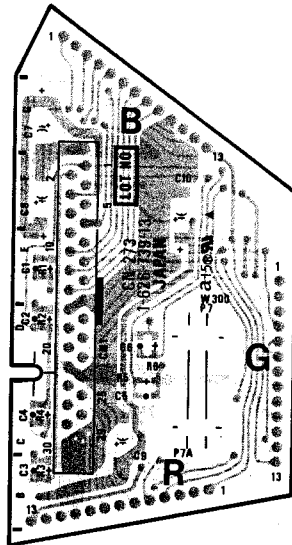
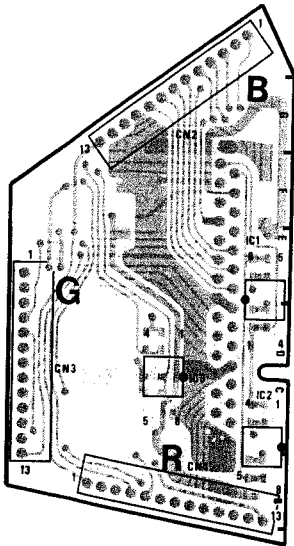
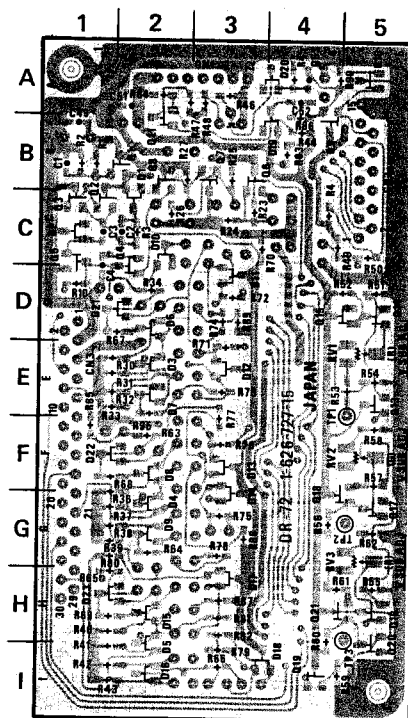
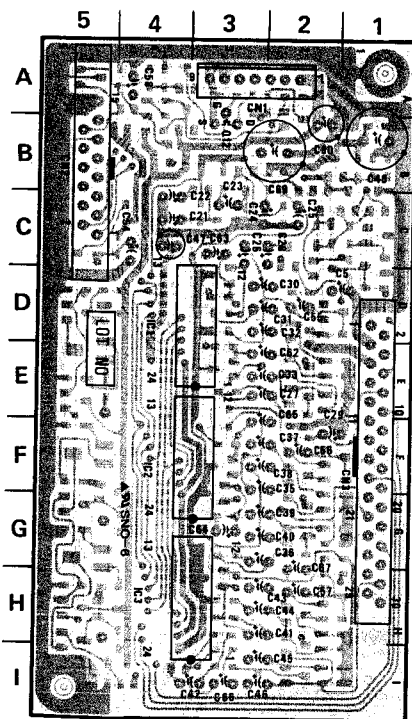
C-1

A

B

C

CN-273 BOARD

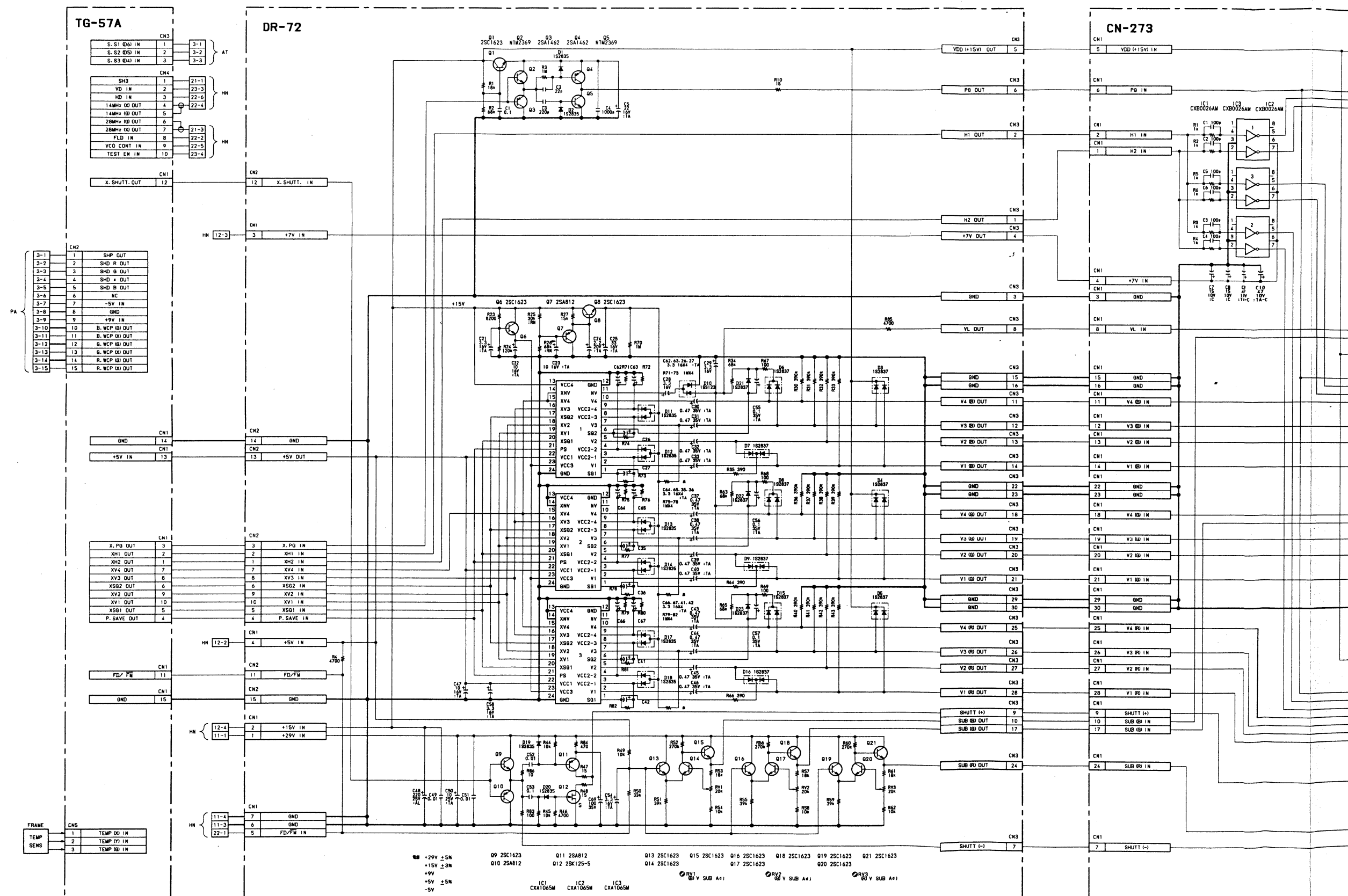
**DR-72 BOARD**

DR-72 (1-626-727-15)

CN1	A - 3	Q1	B - 2
CN2	B - 5	Q2	B - 1
CN3	F - 2	Q3	C - 1
		Q4	C - 2
D1	B - 2	Q5	C - 1
D2	C - 1	Q6	B - 3
D3	E - 2	Q7	B - 3
D4	G - 2	Q8	B - 2
D5	I - 2	Q9	B - 4
D6	D - 2	Q10	A - 5
D7	E - 2	Q11	B - 2
D8	F - 2	Q12	B - 3
D9	G - 2	Q13	E - 5
D10	C - 2	Q14	D - 5
D11	D - 3	Q15	D - 4
D12	E - 3	Q16	H - 5
D13	F - 3	Q17	G - 5
D14	F - 3	Q18	G - 4
D15	H - 2	Q19	I - 4
D16	I - 2	Q20	I - 5
D17	H - 3	Q21	H - 4
D18	I - 4		
D19	B - 4	RV1	E - 5
D20	A - 4	RV2	F - 5
D21	D - 1	RV3	G - 5
D22	F - 1		
D23	H - 1		
IC1	D - 4		
IC2	F - 4		
IC3	H - 4		

CN-273 BOARD
DR-72 BOARD

CN-273
DR-72 CCD BLOCK (1/2)  CCD BLOCK (1/2) CN-273
DR-72



BVP-7A (J, UC)
BVP-7AP (EK)
B-BVP7A-CCDBLOCK/M#1

C-3

B

C

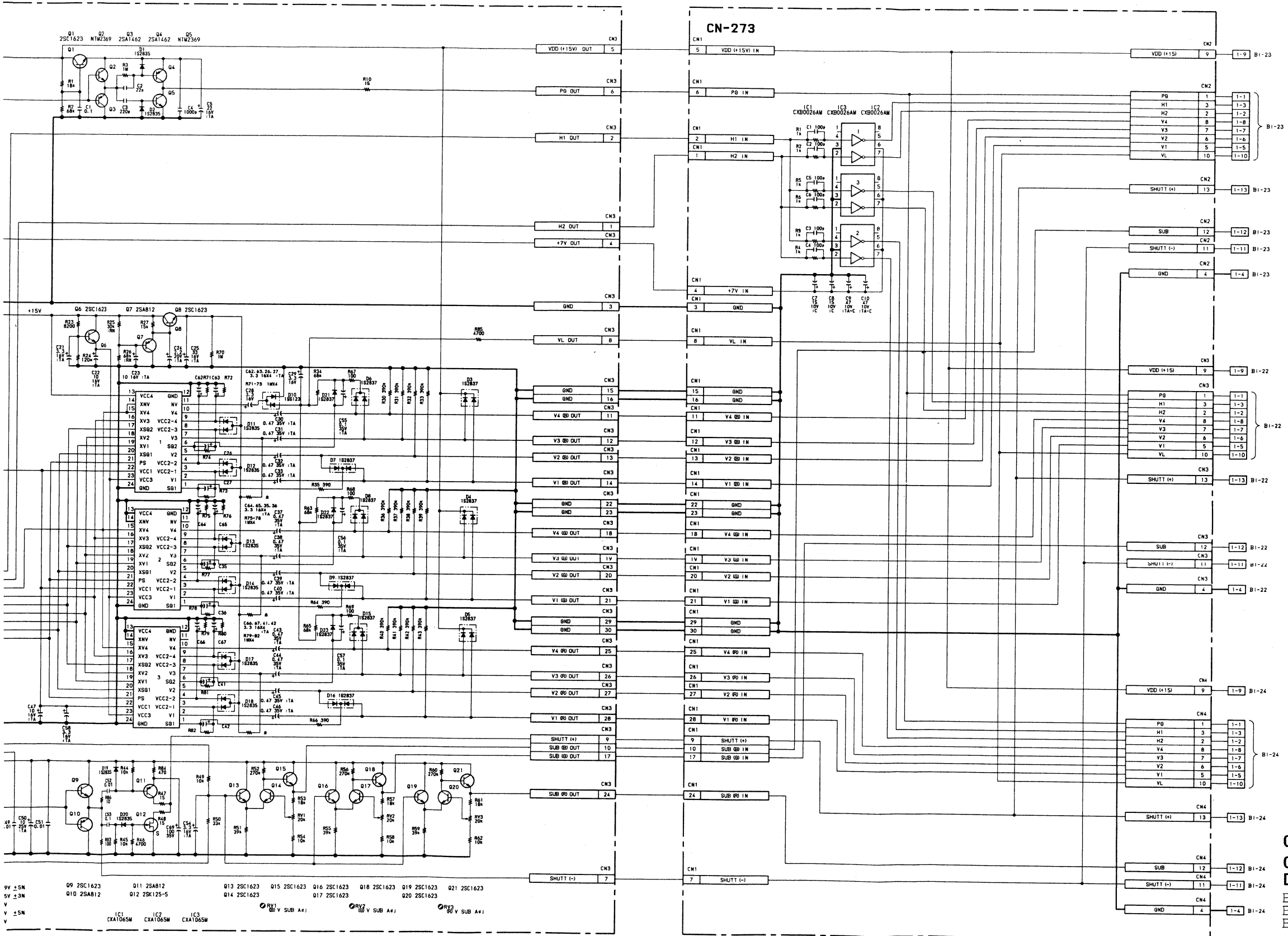
D

E

C-4

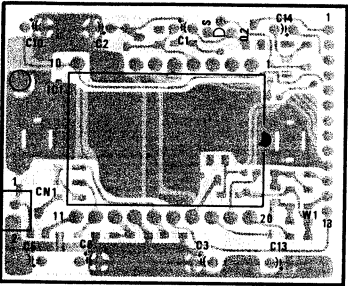
F

G

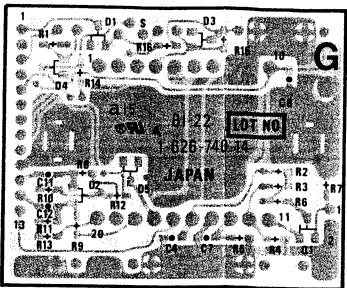


CCD BLOCK (1/2)
CN-273 BOARD
DR-72 BOARD

BI-22 BOARD

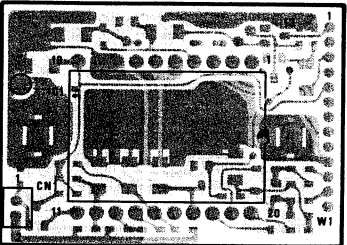


1-626-740-14 SOLDERING SIDE

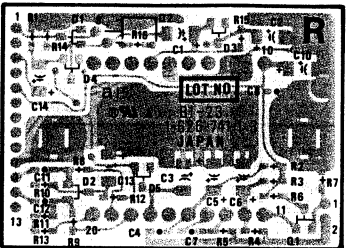


1-626-740-14 SOLDERING SIDE

BI-23 BOARD

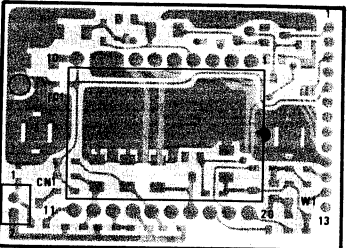


1-626-741-13 SOLDERING SIDE

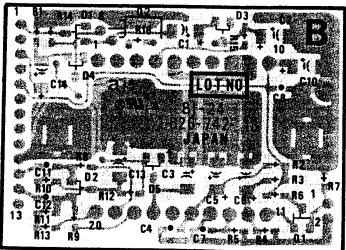


1-626-741-13 SOLDERING SIDE

BI-24 BOARD

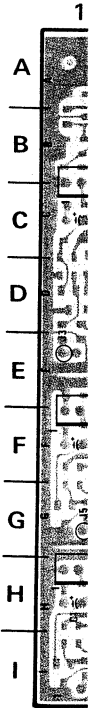


1-626-742-13 SOLDERING SIDE



1-626-742-13 SOLDERING SIDE

PA-135



SIDE

C-6

C-7

A

B

C

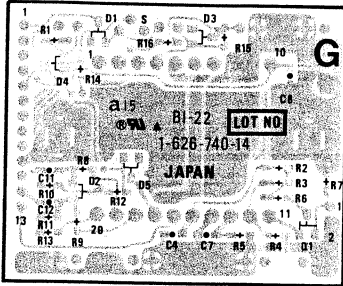
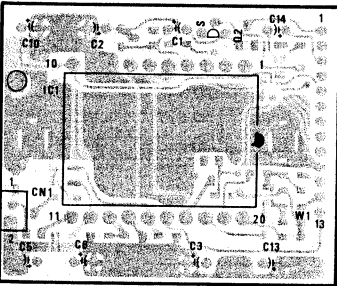
D

E

F

G

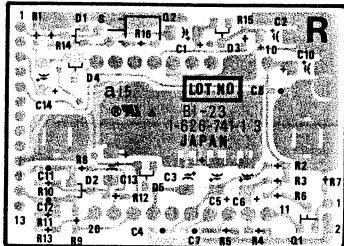
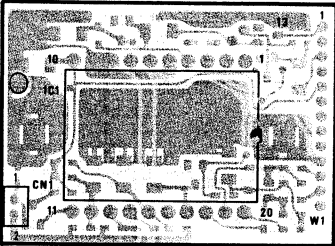
BI-22 BOARD



1-626-740-14 SOLDERING SIDE

1-626-740-14 SOLDERING SIDE

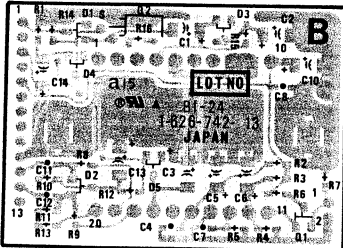
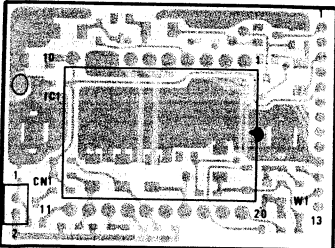
BI-23 BOARD



1-626-741-13 SOLDERING SIDE

1-626-741-13 SOLDERING SIDE

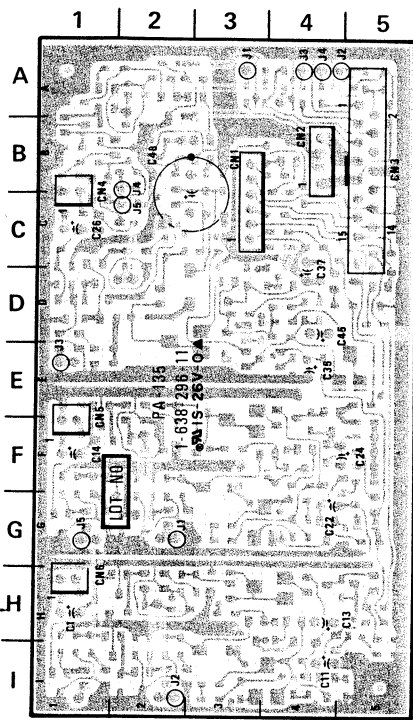
BI-24 BOARD



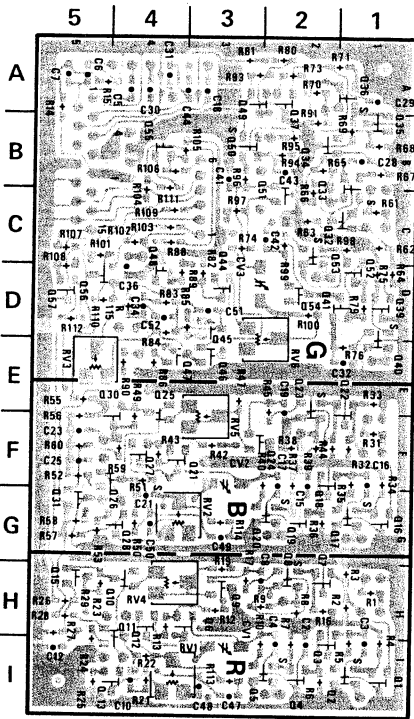
1-626-742-13 SOLDERING SIDE

1-626-742-13 SOLDERING SIDE

PA-135 BOARD



1-638-296-11 SOLDERING SIDE



1-638-296-11 SOLDERING SIDE

PA-135 (1-638-296-11)

CN1 B - 3
CN2 B - 4
CN3 B - 5
CN4 B - 1
CN5 F - 1
CN6 H - 1

CV1 H - 3
CV2 F - 3
CV3 D - 3

Q1 I - 1
Q2 I - 1
Q3 I - 2
Q4 I - 2
Q5 I - 2
Q6 H - 3
Q7 G - 2
Q8 G - 2
Q9 H - 3
Q10 H - 4
Q11 H - 4
Q12 I - 4
Q13 I - 5
Q15 H - 5
Q16 G - 1
Q17 G - 1
Q18 G - 2
Q19 G - 2
Q20 G - 2
Q21 F - 3
Q22 E - 1
Q23 E - 2
Q24 F - 2
Q25 E - 4
Q26 G - 4
Q27 F - 4
Q28 G - 4
Q30 E - 4
Q31 G - 5
Q32 C - 2
Q33 B - 2
Q34 B - 2
Q35 B - 1
Q36 A - 1
Q37 B - 2
Q39 D - 1
Q40 E - 1
Q41 D - 2
Q44 C - 3
Q45 D - 3
Q46 E - 3
Q47 E - 3
Q48 C - 4
Q49 A - 3
Q50 B - 3
Q51 B - 2
Q52 D - 1
Q53 C - 2
Q54 D - 2
Q55 B - 4
Q56 D - 5
Q57 D - 5

RV1 I - 3
RV2 G - 3
RV3 E - 5
RV4 H - 4
RV5 F - 3
RV6 E - 2

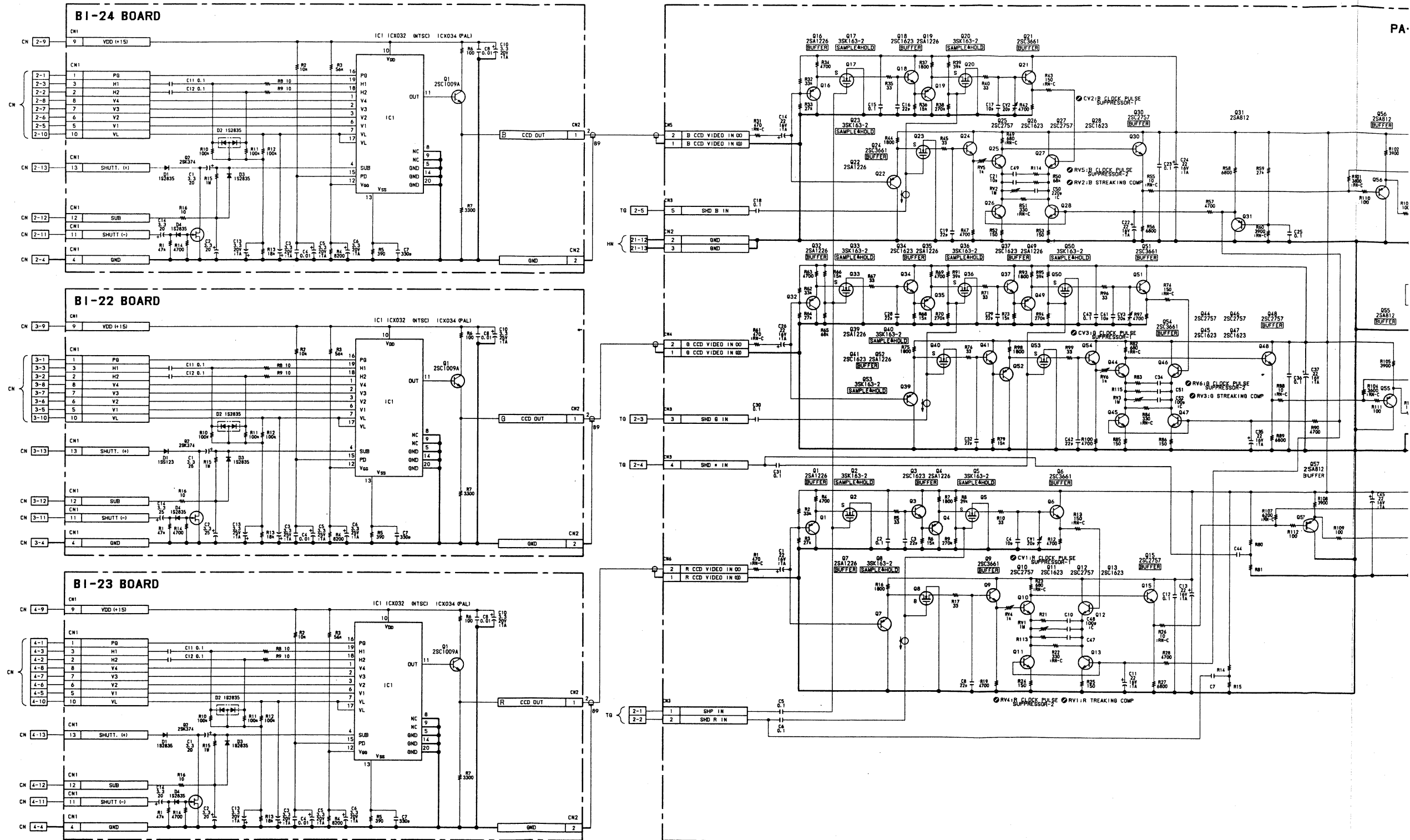
BVP-7A (J,UC)
BVP-7AP (E<)

CCD BLOCK (2/2)

BI-22 BOARD
BI-23 BOARD
BI-24 BOARD
PA-135 BOARD

BI-22 BI-23
BI-24 PA-135 CCD BLOCK (2/2)

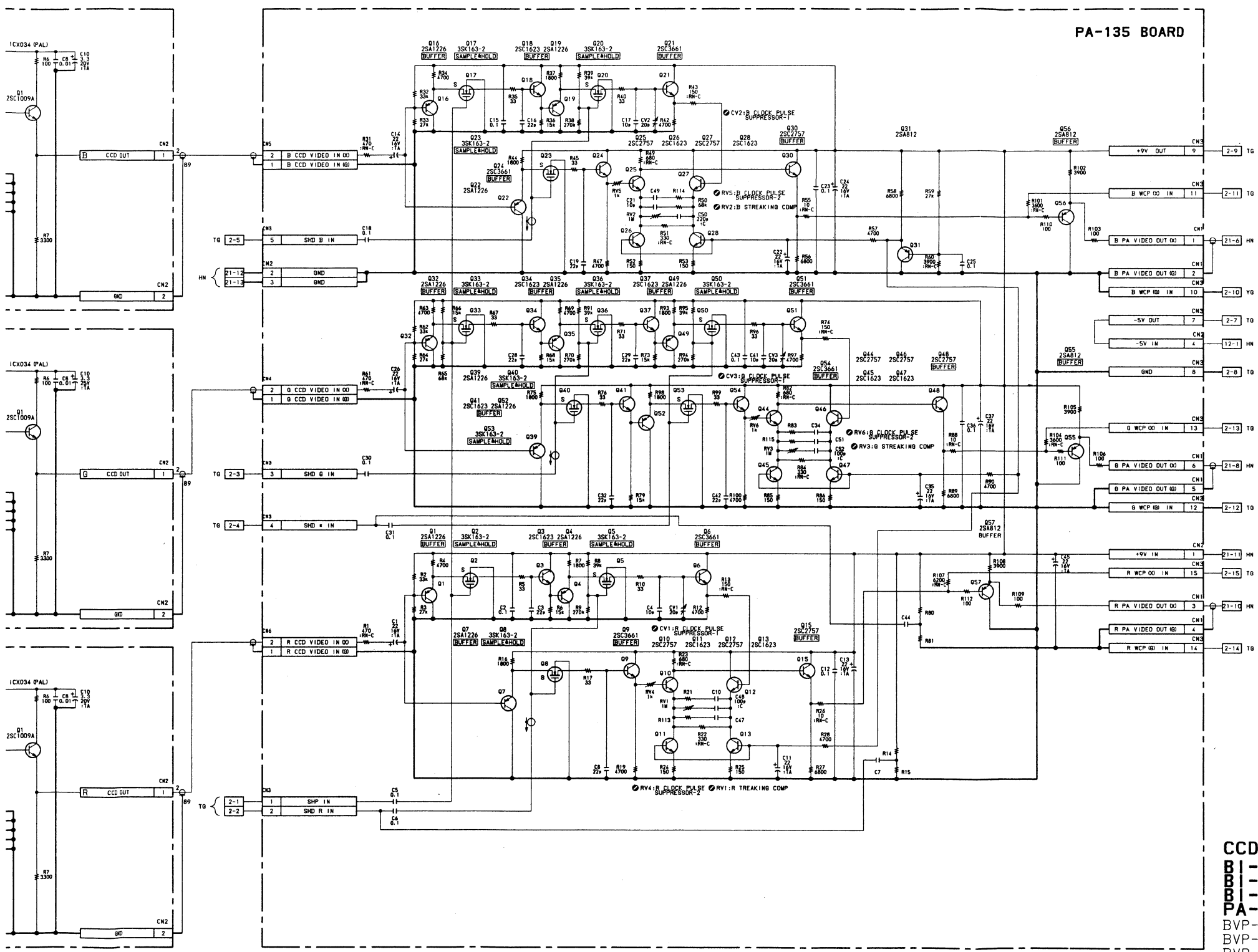
BI-22 BI-23
BI-24 PA-135 CCD BLOCK (2/2)



BVP-7A (J, UC)
BVP-7AP (EK)
B-BVP7A-CCDBLOCK/M#2

C-9

C-10

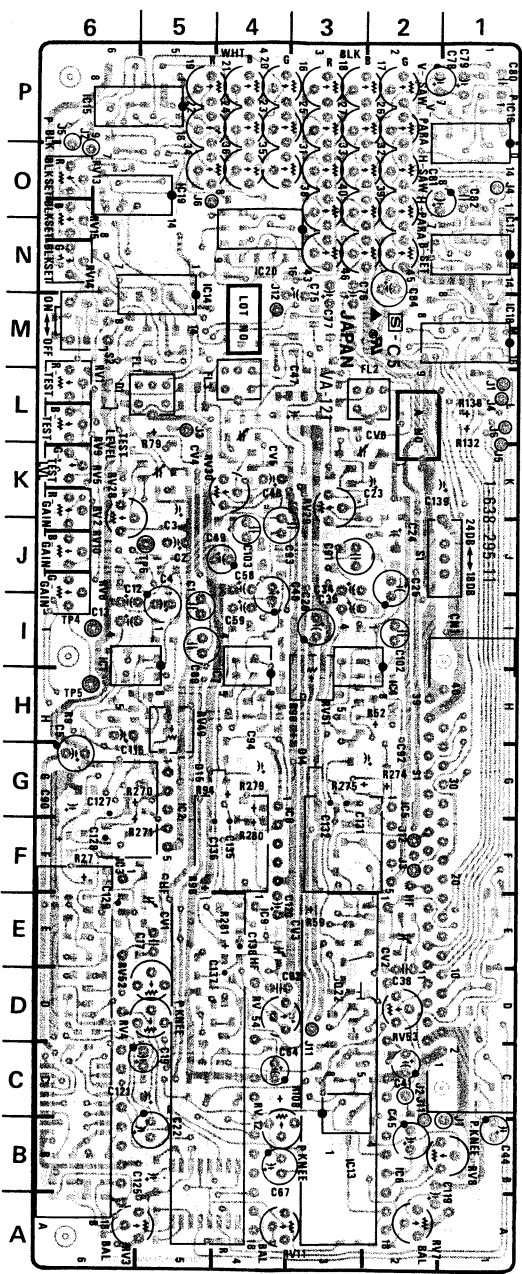


CCD BLOCK (2/2)
BI-22 BOARD
BI-23 BOARD
BI-24 BOARD
PA-135 BOARD
BVP-7A (J)
BVP-7A (UC)
BVP-7AP (EK)

VA-121 BOARD

VA-121 (1-638-295-11)

CN1	I - 1	RV1	L - 6
CV1	E - 5	RV2	J - 6
CV2	E - 2	RV3	A - 6
CV3	E - 3	RV4	D - 6
CV4	K - 5	RV5	K - 6
CV5	K - 4	RV6	I - 6
CV6	L - 2	RV7	A - 1
		RV8	B - 1
		RV9	K - 6
D1	L - 6	RV10	J - 6
D3	G - 5	RV11	A - 3
D4	L - 3	RV12	B - 4
D5	G - 2	RV13	O - 6
D6	D - 1	RV14	N - 6
D7	L - 4	RV15	N - 6
D8	G - 4	RV16	P - 3
D10	M - 3	RV17	P - 2
D14	G - 3	RV18	P - 3
D15	G - 5	RV19	P - 5
D16	F - 6	RV20	P - 4
		RV21	P - 4
FL1	L - 6	RV22	P - 5
FL2	L - 2	RV23	P - 4
FL3	L - 5	RV24	P - 4
		RV25	P - 3
IC1	I - 6	RV26	P - 2
IC2	G - 5	RV27	P - 3
IC3	F - 6	RV28	K - 6
IC4	H - 2	RV29	K - 3
IC5	G - 2	RV30	K - 5
IC6	B - 2	RV31	O - 3
IC7	H - 4	RV32	O - 2
IC8	G - 3	RV33	O - 3
IC9	E - 4	RV34	O - 5
IC10	C - 6	RV35	O - 4
IC11	A - 4	RV36	O - 4
IC13	B - 3	RV38	O - 3
IC14	N - 5	RV39	O - 2
IC15	P - 6	RV40	O - 3
IC16	P - 1	RV43	N - 3
IC17	N - 1	RV45	N - 2
IC18	M - 1	RV46	N - 3
IC19	O - 5	RV49	H - 5
IC20	N - 4	RV51	H - 3
		RV52	D - 6
		RV53	D - 2
		RV54	D - 4
Q1	L - 6		
Q2	K - 6	S1	J - 2
Q3	J - 6	S2	M - 6
Q4	J - 5		
Q5	H - 6	TP4	I - 6
Q6	H - 5	TP5	H - 6
Q8	F - 6	TP6	J - 6
Q9	E - 6		
Q10	D - 6		
Q11	E - 6		
Q12	M - 3		
Q13	K - 3		
Q14	J - 3		
Q15	J - 2		
Q16	H - 3		
Q17	H - 2		
Q18	F - 2		
Q19	E - 3		
Q20	D - 3		
Q21	D - 3		
Q22	D - 3		
Q23	M - 4		
Q24	K - 4		
Q25	J - 4		
Q26	J - 3		
Q27	H - 4		
Q28	H - 3		
Q29	F - 3		
Q30	E - 4		
Q31	D - 4		
Q32	D - 4		
Q33	E - 1		
Q34	L - 1		
Q35	M - 5		
Q36	M - 6		
Q37	M - 5		
Q40	M - 6		
Q41	C - 5		
Q42	N - 2		
Q43	G - 6		
Q44	K - 5		

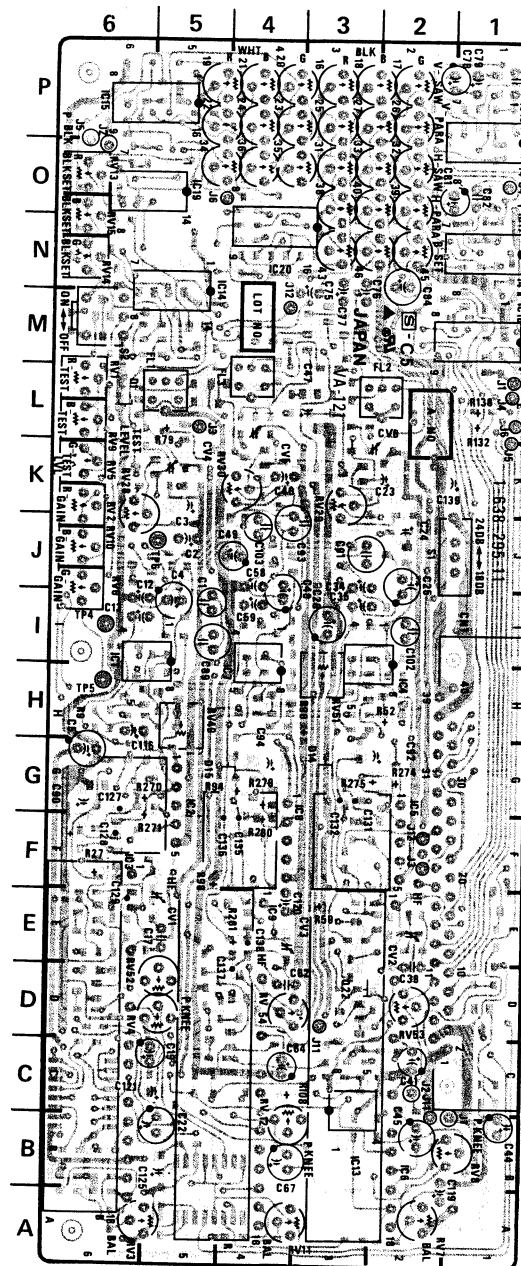


1-638-588-11 SOLDERING SIDE

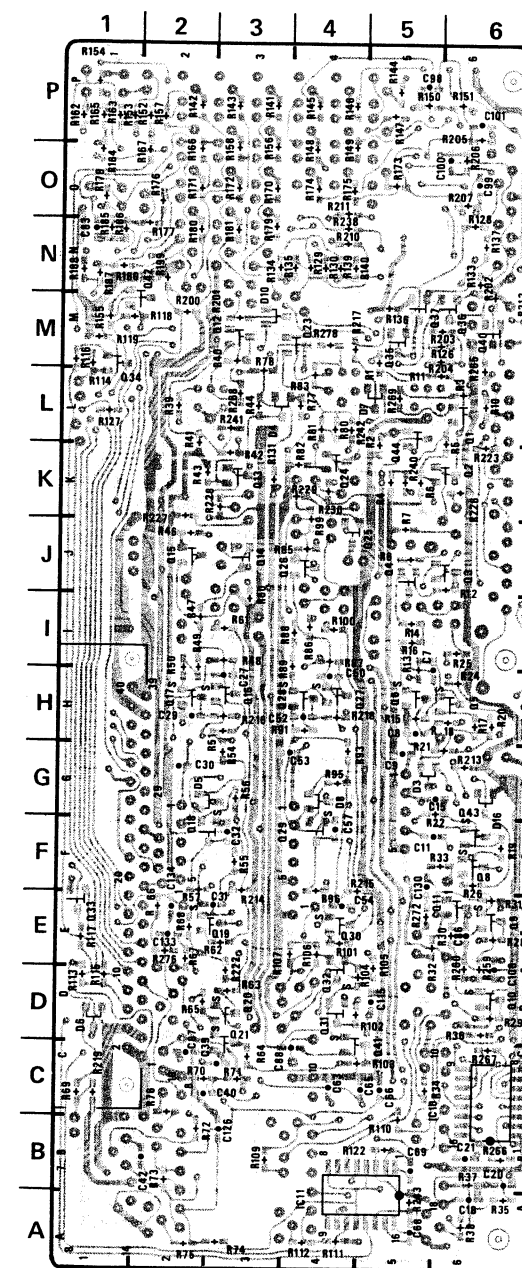
VA-121 BOARD

VA-121 (1-638-295-11)

CN1	I-1	RV1	L-6
CV1	E-5	RV2	J-6
CV2	E-2	RV3	A-6
CV3	E-3	RV4	D-6
CV4	K-5	RV5	K-6
CV5	K-4	RV6	I-6
CV6	L-2	RV7	A-1
		RV8	B-1
		RV9	K-6
D1	L-6	RV10	J-6
D3	G-5	RV11	A-3
D4	L-3	RV12	B-4
D5	G-2	RV13	O-6
D6	D-1	RV14	N-6
D7	L-4	RV15	N-6
D8	G-4	RV16	P-3
D10	M-3	RV17	P-2
D14	G-3	RV18	P-3
D15	G-5	RV19	P-5
D16	F-6	RV20	P-4
		RV21	P-4
FL1	L-6	RV22	P-5
FL2	L-2	RV23	P-4
FL3	L-5	RV24	P-4
		RV25	P-3
IC1	I-6	RV26	P-2
IC2	G-5	RV27	P-3
IC3	F-6	RV28	K-6
IC4	H-2	RV29	K-3
IC5	G-2	RV30	K-5
IC6	B-2	RV31	O-3
IC7	H-4	RV32	O-2
IC8	G-3	RV33	O-3
IC9	E-4	RV34	O-5
IC10	C-6	RV35	O-4
IC11	A-4	RV36	O-4
IC13	B-3	RV38	O-3
IC14	N-5	RV39	O-2
IC15	P-6	RV40	O-3
IC16	P-1	RV43	N-3
IC17	N-1	RV45	N-2
IC18	M-1	RV46	N-3
IC19	O-5	RV49	H-5
IC20	N-4	RV51	H-3
		RV52	D-6
		RV53	D-2
		RV54	D-4
Q1	L-6	S1	J-2
Q2	K-6	S2	M-6
Q3	J-6		
Q4	J-5	TP4	I-6
Q5	H-6	TP5	H-6
Q6	H-5	TP6	J-6
Q8	F-6		
Q9	E-6		
Q10	D-6		
Q11	E-6		
Q12	M-3		
Q13	K-3		
Q14	J-3		
Q15	J-2		
Q16	H-3		
Q17	H-2		
Q18	F-2		
Q19	E-3		
Q20	D-3		
Q21	D-3		
Q22	D-3		
Q23	M-4		
Q24	K-4		
Q25	J-4		
Q26	J-3		
Q27	H-4		
Q28	H-3		
Q29	F-3		
Q30	E-4		
Q31	D-4		
Q32	D-4		
Q33	E-1		
Q34	L-1		
Q35	M-5		
Q36	M-6		
Q37	M-5		
Q40	M-6		
Q41	C-5		
Q42	N-2		
Q43	G-6		
Q44	K-5		



1-638-295-11 SOLDERING SIDE



1-638-295-11 SOLDERING SIDE

VA-121 (1-638-295-11)

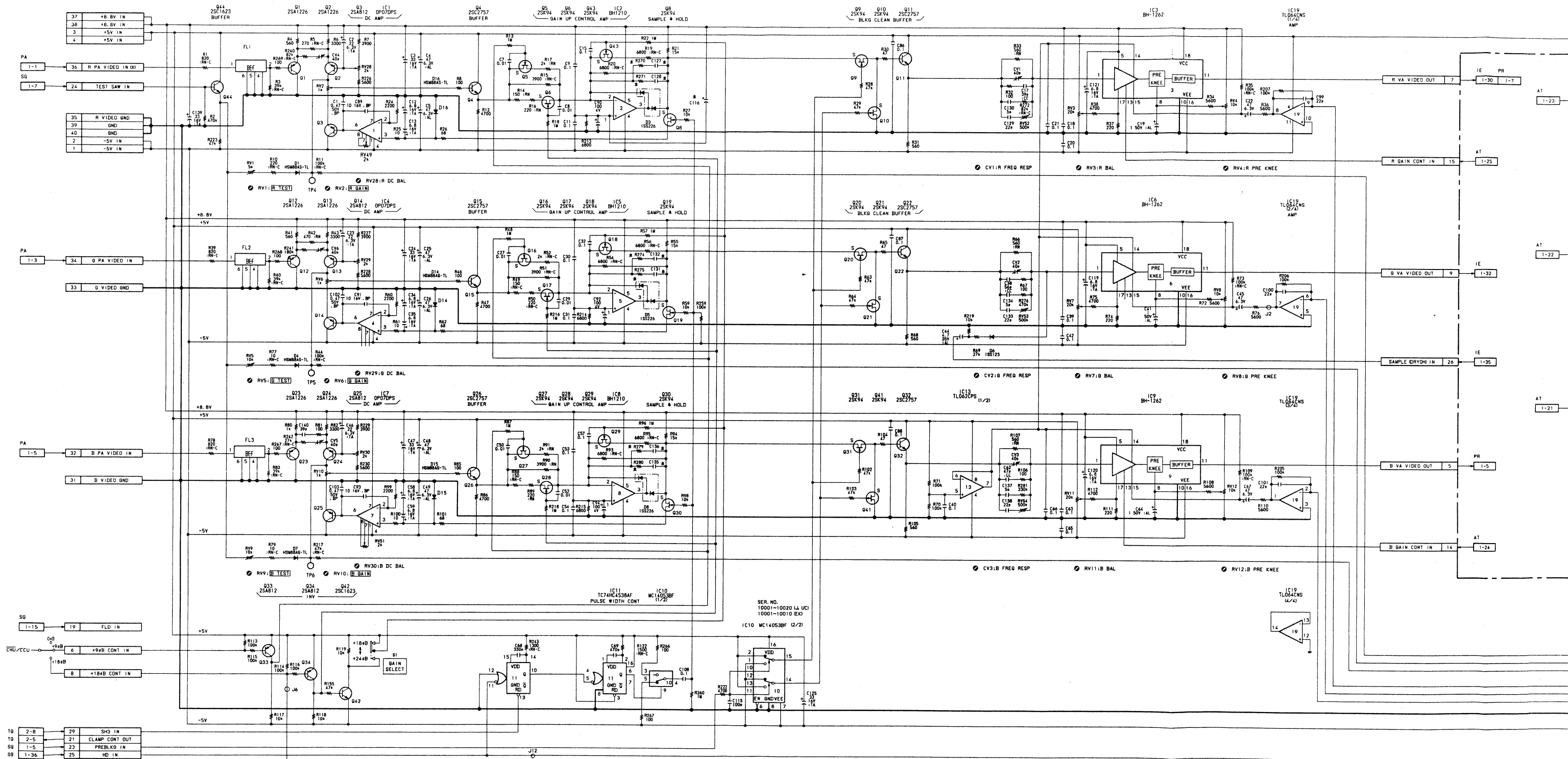
CN1	I-1	RV1	L-6
CV1	E-5	RV2	J-6
CV2	E-2	RV3	A-6
CV3	E-3	RV4	D-6
CV4	K-5	RV5	K-6
CV5	K-4	RV6	I-6
CV6	L-2	RV7	A-1
		RV8	B-1
		RV9	K-6
D1	L-6	RV10	J-6
D3	G-5	RV11	A-3
D4	L-3	RV12	B-4
D5	G-2	RV13	O-6
D6	D-1	RV14	N-6
D7	L-4	RV15	N-6
D8	G-4	RV16	P-3
D10	M-3	RV17	P-2
D14	G-3	RV18	P-3
D15	G-5	RV19	P-5
D16	F-6	RV20	P-4
		RV21	P-4
FL1	L-6	RV22	P-5
FL2	L-2	RV23	P-4
FL3	L-5	RV24	P-4
		RV25	P-3
IC1	I-6	RV26	P-2
IC2	G-5	RV27	P-3
IC3	F-6	RV28	K-6
IC4	H-2	RV29	K-3
IC5	G-2	RV30	K-5
IC6	B-2	RV31	O-3
IC7	H-4	RV32	O-2
IC8	G-3	RV33	O-3
IC9	E-4	RV34	O-5
IC10	C-6	RV35	O-4
IC11	A-4	RV36	O-4
IC13	B-3	RV38	O-3
IC14	N-5	RV39	O-2
IC15	P-6	RV40	O-3
IC16	P-1	RV43	N-3
IC17	N-1	RV45	N-2
IC18	M-1	RV46	N-3
IC19	O-5	RV49	H-5
IC20	N-4	RV51	H-3
		RV52	D-6
		RV53	D-2
		RV54	D-4
Q1	L-6	S1	J-2
Q2	K-6	S2	M-6
Q3	J-6		
Q4	J-5	TP4	I-6
Q5	H-6	TP5	H-6
Q6	H-5	TP6	J-6
Q8	F-6		
Q9	E-6		
Q10	D-6		
Q11	E-6		
Q12	M-3		
Q13	K-3		
Q14	J-3		
Q15	J-2		
Q16	H-3		
Q17	H-2		
Q18	F-2		
Q19	E-3		
Q20	D-3		
Q21	D-3		
Q22	D-3		
Q23	M-4		
Q24	K-4		
Q25	J-4		
Q26	J-3		
Q27	H-4		
Q28	H-3		
Q29	F-3		
Q30	E-4		
Q31	D-4		
Q32	D-4		
Q33	E-1		
Q34	L-1		
Q35	M-5		
Q36	M-6		
Q37	M-5		
Q40	M-6		
Q41	C-5		
Q42	N-2		
Q43	G-6		
Q44	K-5		

C-13

C-14

BVP-7A (J, UC)
BVP-7AP (EK)

VA-121 BOARD
VIDEO AMPLIFIER



BVP-7A (J, UC)
BVP-7AP (EK)
B-BVP7A-VA121/M

C-15

C-16

A

B

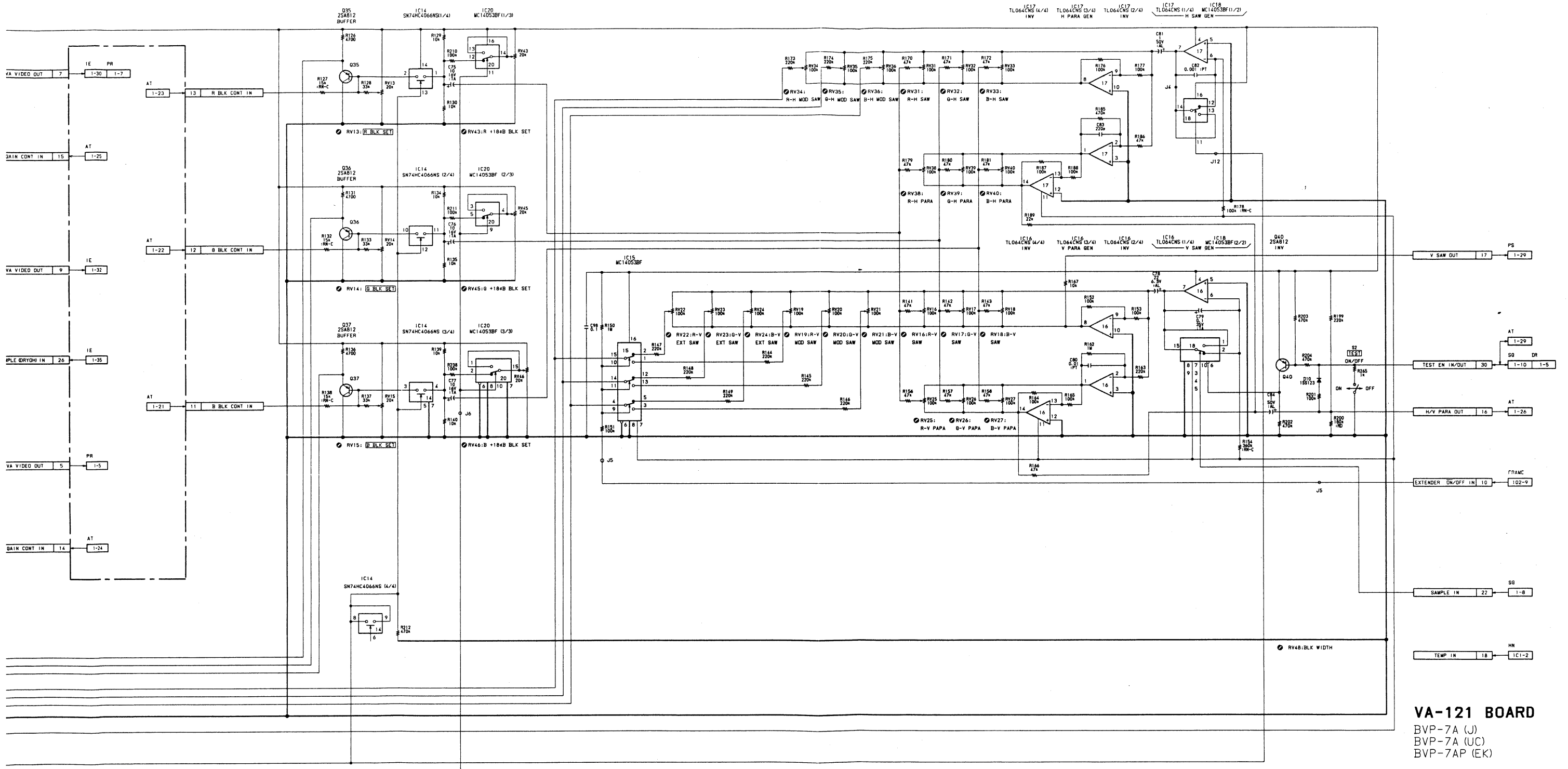
C

D

E

F

G





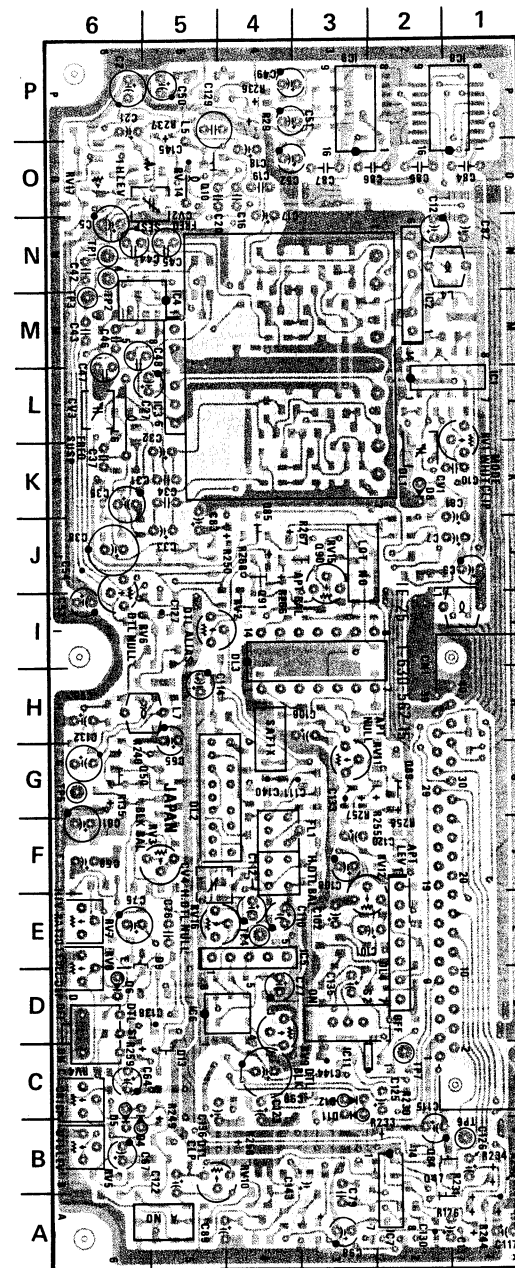
IE-25A/25AP (1-630-56)

CN1	H - 2
CV1	K - 2
CV2	O - 6
CV3	L - 6
CV4	F - 5
D1	G - 3
D2	B - 4
D3	B - 3
D4	B - 6
D5	B - 6
D6	D - 6
D7	B - 1
D8	K - 2
D9	E - 5
D10	F - 3
D11	C - 3
D12	C - 3
D13	C - 5
DL1	K - 2
DL2	G - 5
DL3	I - 4
DL4	D - 2
FL1	F - 3
IC1	L - 1
IC2	M - 2
IC3	L - 5
IC4	M - 5
IC5	E - 3
IC6	D - 5
IC7	A - 2
IC8	P - 1
IC9	P - 3
IC10	P - 1
IC11	C - 3
Q1	J - 2
Q2	J - 3
Q3	K - 2
Q4	N - 3
Q5	N - 3
Q6	M - 3
Q7	M - 4
Q8	N - 4
Q9	O - 5
Q10	O - 5
Q11	O - 5
Q12	O - 6
Q13	O - 6
Q14	N - 6
Q15	M - 1
Q16	L - 3
Q17	L - 3
Q18	K - 4
Q19	K - 4
Q20	L - 4
Q21	L - 6
Q22	L - 5
Q23	J - 4
Q24	N - 6
Q25	N - 5
Q26	N - 5
Q27	M - 6
Q28	M - 6
Q29	M - 5
Q30	M - 5
Q31	P - 4
Q32	P - 4
Q33	P - 5
Q34	H - 4
Q35	H - 4
Q36	G - 4
Q37	E - 5
Q38	E - 6
Q39	E - 5
Q41	G - 5
Q42	G - 6
Q43	G - 5
Q44	A - 6
Q45	B - 6
Q46	B - 2
Q47	B - 2
Q48	I - 5
Q49	I - 5

IE-25A/25AP BOARD

IE-25A/25AP (1-630-562-15)

CN1	H-2	Q50	G-6
CV1	K-2	Q51	E-6
CV2	O-6	Q52	D-5
CV3	L-6	Q53	D-5
CV4	F-5	Q54	E-6
		Q55	C-5
		Q56	B-4
D1	G-3	Q57	A-4
D2	B-4	Q63	G-6
D3	B-3	Q65	I-3
D4	B-6	Q66	H-2
D5	B-6	Q67	H-4
D6	D-6	Q68	G-2
D7	B-1	Q69	G-2
D8	K-2	Q70	F-2
D9	E-5	Q71	E-3
D10	F-3	Q72	D-3
D11	C-3	Q75	J-2
D12	C-3	Q76	C-4
D13	C-5	Q77	B-4
		Q79	J-4
DL1	K-2	Q81	C-3
DL2	G-5	Q82	C-2
DL3	I-4	Q83	A-1
DL4	D-2	Q84	B-2
		Q85	K-4
FL1	F-3	Q89	G-2
		Q90	J-3
		Q91	I-4
IC1	L-1	RV1	K-1
IC2	M-2	RV2	I-4
IC3	L-5	RV3	F-5
IC4	M-5	RV4	C-6
IC5	E-3	RV5	B-6
IC6	D-5	RV6	I-6
IC7	A-2	RV7	E-6
IC8	P-1	RV8	E-6
IC9	P-3	RV9	C-3
IC10	P-1	RV10	B-5
IC11	C-3	RV11	G-2
		RV12	F-2
Q1	J-2	RV14	O-5
Q2	J-3	RV15	J-3
Q3	K-2	RV16	E-5
Q4	N-3	RV17	O-6
Q5	N-3		
Q6	M-3	S1	D-6
Q7	M-4	S2	D-3
Q8	N-4		
Q9	O-5	TP1	N-6
Q10	O-5	TP2	M-6
Q11	O-5	TP3	M-6
Q12	O-6	TP4	E-4
Q13	O-6	TP5	G-6
Q14	N-6	TP6	B-1
Q15	M-1	TP7	C-2
Q16	L-3		
Q17	L-3		
Q18	K-4		
Q19	K-4		
Q20	L-4		
Q21	L-6		
Q22	L-5		
Q23	J-4		
Q24	N-6		
Q25	N-5		
Q26	N-5		
Q27	M-6		
Q28	M-6		
Q29	M-5		
Q30	M-5		
Q31	P-4		
Q32	P-4		
Q33	P-5		
Q34	H-4		
Q35	H-4		
Q36	G-4		
Q37	E-5		
Q38	E-6		
Q39	E-5		
Q41	G-5		
Q42	G-6		
Q43	G-5		
Q44	A-6		
Q45	B-6		
Q46	B-2		
Q47	B-2		
Q48	I-5		
Q49	I-5		

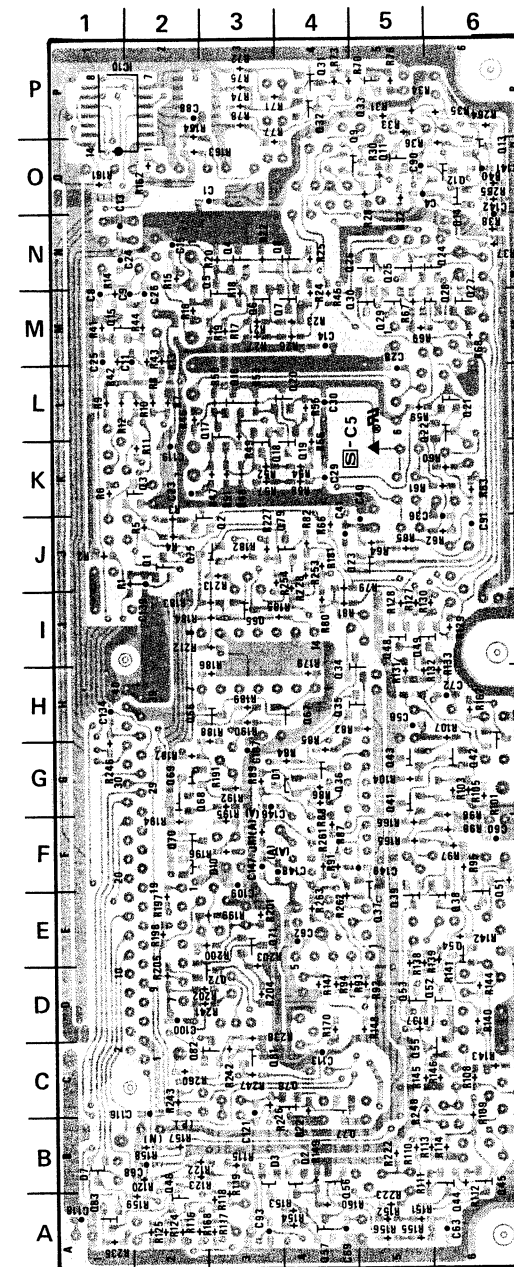


1-630-562-15 SOLDERING SIDE

C-21

IE-25A/25AP (1-630-562-15)

CN1	H-2	Q50	G-6
		Q51	E-6
CV1	K-2	Q52	D-5
CV2	O-6	Q53	D-5
CV3	L-6	Q54	E-6
CV4	F-5	Q55	C-5
		Q56	B-4
D1	G-3	Q57	A-4
D2	B-4	Q63	G-6
D3	B-3	Q65	I-3
D4	B-6	Q66	H-2
D5	B-6	Q67	H-4
D6	D-6	Q68	G-2
D7	B-1	Q69	G-2
D8	K-2	Q70	F-2
D9	E-5	Q71	E-3
D10	F-3	Q72	D-3
D11	C-3	Q75	J-2
D12	C-3	Q76	C-4
D13	C-5	Q77	B-4
		Q79	J-4
DL1	K-2	Q81	C-3
DL2	G-5	Q82	C-2
DL3	I-4	Q83	A-1
DL4	D-2	Q84	B-2
		Q85	K-4
FL1	F-3	Q89	G-2
		Q90	J-3
		Q91	I-4
IC1	L-1	RV1	K-1
IC2	M-2	RV2	I-4
IC3	L-5	RV3	F-5
IC4	M-5	RV4	C-6
IC5	E-3	RV5	B-6
IC6	D-5	RV6	I-6
IC7	A-2	RV7	E-6
IC8	P-1	RV8	E-6
IC9	P-3	RV9	C-3
IC10	P-1	RV10	B-5
IC11	C-3	RV11	G-2
		RV12	F-2
Q1	J-2	RV14	O-5
Q2	J-3	RV15	J-3
Q3	K-2	RV16	E-5
Q4	N-3	RV17	O-6
Q5	N-3		
Q6	M-3	S1	D-6
Q7	M-4	S2	D-3
Q8	N-4		
Q9	O-5	TP1	N-6
Q10	O-5	TP2	M-6
Q11	O-5	TP3	M-6
Q12	O-6	TP4	E-4
Q13	O-6	TP5	G-6
Q14	N-6	TP6	B-1
Q15	M-1	TP7	C-2
Q16	L-3		
Q17	L-3		
Q18	K-4		
Q19	K-4		
Q20	L-4		
Q21	L-6		
Q22	L-5		
Q23	J-4		
Q24	N-6		
Q25	N-5		
Q26	N-5		
Q27	M-6		
Q28	M-6		
Q29	M-5		
Q30	M-5		
Q31	P-4		
Q32	P-4		
Q33	P-5		
Q34	H-4		
Q35	H-4		
Q36	G-4		
Q37	E-5		
Q38	E-6		
Q39	E-5		
Q41	G-5		
Q42	G-6		
Q43	G-5		
Q44	A-6		
Q45	B-6		
Q46	B-2		
Q47	B-2		
Q48	I-5		
Q49	I-5		

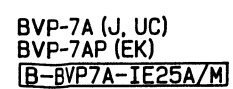


1-630-562-15 SOLDERING SIDE

C-22

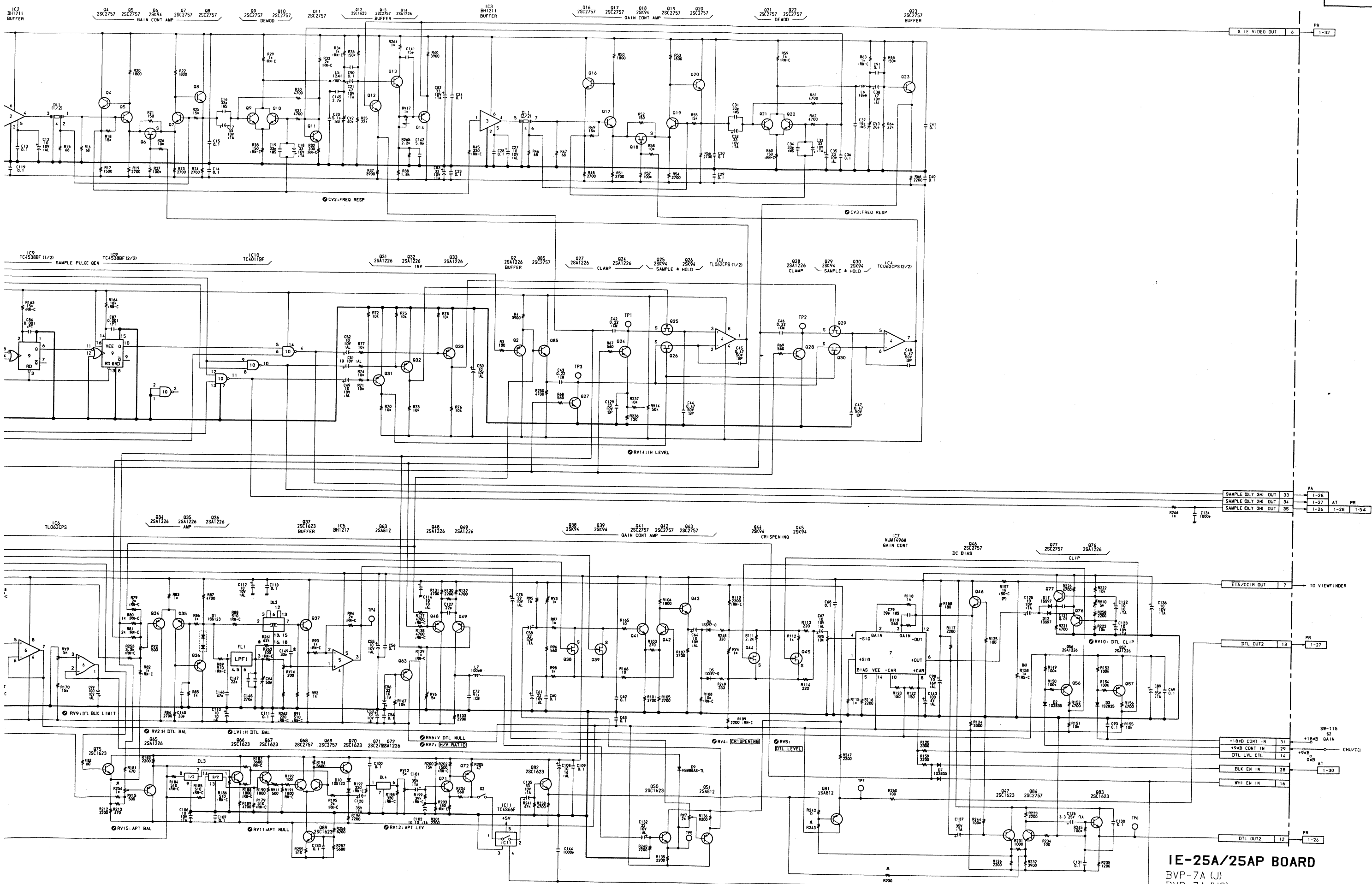
BVP-7A (J, UC)
BVP-7AP (EK)

IE-25A/25AP



C-24

G



IE-25A/25AP BOARD

BVP-7A (J)
BVP-7A (UC)
BVP-7AP (EK)

C-24

C-25

D

E

F

G

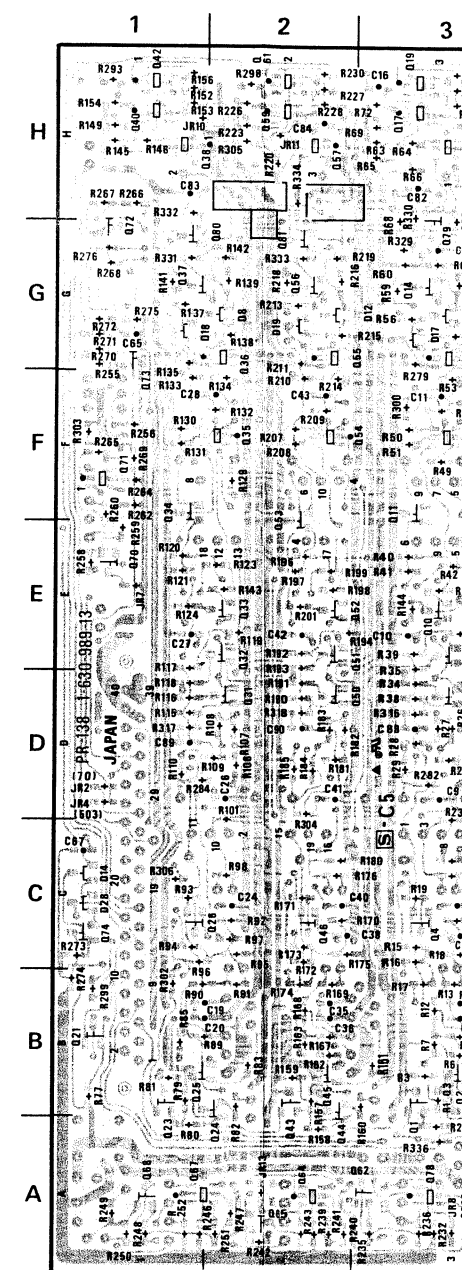
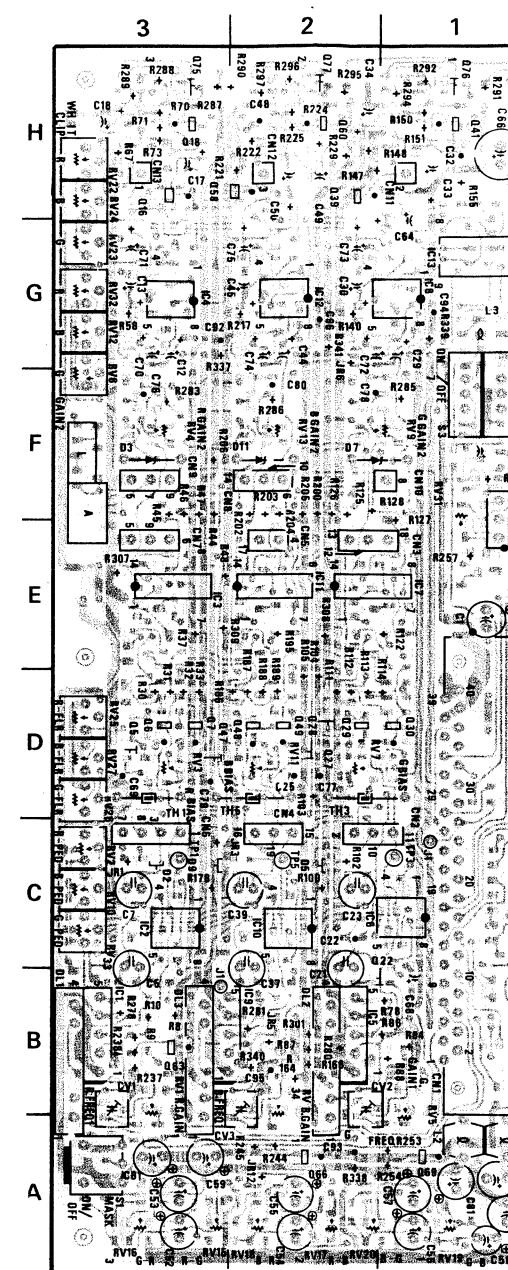
H

I

PR-138D/138E BOARD
PR-139 BOARD
PR-140 BOARD

PR-138D/138E (1-630-989-13, 14)

CN1	B - 1	Q26	C - 2
CN2	C - 1	Q27	D - 2
CN3	E - 1	Q28	D - 2
CN4	D - 2	Q29	D - 2
CN5	E - 2	Q30	D - 1
CN6	C - 3	Q31	D - 2
CN7	E - 3	Q32	E - 2
CN8	F - 3	Q33	E - 2
CN9	F - 3	Q34	F - 1
CN10	F - 1	Q35	F - 2
CN11	H - 1	Q36	G - 2
CN12	H - 2	Q37	G - 1
CN13	H - 3	Q38	H - 1
		Q39	H - 2
CV1	B - 3	Q40	H - 1
CV2	B - 1	Q42	H - 1
CV3	A - 2	Q43	A - 2
		Q44	A - 2
D3	F - 3	Q45	B - 2
D4	G - 3	Q46	C - 2
D5	C - 2	Q47	D - 3
D7	F - 2	Q48	D - 2
D8	G - 2	Q49	D - 2
D11	F - 2	Q50	D - 3
D12	G - 3	Q51	E - 3
D14	C - 1	Q52	E - 3
D15	B - 3	Q53	E - 2
D16	F - 3	Q54	F - 3
D17	G - 3	Q55	G - 2
D18	G - 1	Q56	G - 2
D19	G - 2	Q57	H - 2
D28	C - 1	Q58	H - 3
		Q59	H - 2
DL1	B - 3	Q61	H - 2
DL2	B - 2	Q62	A - 3
DL3	B - 3	Q63	B - 3
DL4	E - 1	Q64	A - 2
		Q65	A - 2
IC1	B - 3	Q66	A - 2
IC2	C - 3	Q67	A - 1
IC3	E - 3	Q68	A - 1
IC4	G - 3	Q69	A - 1
IC5	B - 2	Q70	E - 1
IC6	C - 2	Q71	F - 1
IC7	E - 1	Q72	G - 1
IC8	G - 1	Q73	F - 1
IC9	B - 2	Q74	C - 1
IC10	C - 2	Q75	H - 3
IC11	E - 2	Q76	H - 1
IC12	G - 2	Q77	H - 2
IC13	G - 1	Q78	A - 3
JR1	C - 3	RV1	B - 3
JR2	D - 1	RV2	C - 3
JR3	C - 2	RV3	D - 3
JR5	B - 2	RV4	F - 3
JR6	G - 2	RV5	B - 1
JR7	E - 1	RV7	D - 2
JR8	A - 3	RV8	F - 3
JR9	H - 3	RV9	F - 1
JR10	H - 1	RV10	C - 3
JR11	H - 2	RV11	D - 2
JR12	A - 2	RV12	G - 3
JR13	A - 2	RV13	F - 2
		RV15	A - 3
Q1	A - 3	RV16	A - 3
Q2	B - 3	RV17	A - 2
Q3	B - 3	RV18	A - 2
Q4	C - 3	RV19	A - 1
Q5	D - 3	RV20	A - 2
Q6	D - 3	RV22	H - 3
Q7	D - 3	RV23	G - 3
Q8	D - 3	RV24	H - 3
Q9	E - 3	RV25	D - 3
Q10	E - 3	RV26	D - 3
Q11	F - 3	RV27	D - 3
Q12	F - 3	RV31	F - 1
Q13	G - 3	RV32	G - 3
Q14	G - 3	RV33	C - 3
Q15	H - 3	RV34	B - 2
Q16	H - 3		
Q17	H - 3	S1	A - 3
Q19	H - 3	S3	F - 1
Q21	B - 1	S4	F - 1
Q22	C - 1		
Q23	A - 1	TH1	D - 3
Q24	A - 2	TH3	D - 2
Q25	B - 1	TH5	D - 2

TP1 C - 3
TP3 C - 1
TP5 C - 2

PR-138D/138E BOARD
PR-139 BOARD
PR-140 BOARD

PR-138D/138E (1-630-989-13, 14)

CN1	B - 1	Q26	C - 2	TP1	C - 3
CN2	C - 1	Q27	D - 2	TP3	C - 1
CN3	E - 1	Q28	D - 2	TP5	C - 2
CN4	D - 2	Q29	D - 2		
CN5	E - 2	Q30	D - 1		
CN6	C - 3	Q31	D - 2		
CN7	E - 3	Q32	E - 2		
CN8	F - 3	Q33	E - 2		
CN9	F - 3	Q34	F - 1		
CN10	F - 1	Q35	F - 2		
CN11	H - 1	Q36	G - 2		
CN12	H - 2	Q37	G - 1		
CN13	H - 3	Q38	H - 1		
		Q39	H - 2		
CV1	B - 3	Q40	H - 1		
CV2	B - 1	Q42	H - 1		
CV3	A - 2	Q43	A - 2		
		Q44	A - 2		
D3	F - 3	Q45	B - 2		
D4	G - 3	Q46	C - 2		
D5	C - 2	Q47	D - 3		
D7	F - 2	Q48	D - 2		
D8	G - 2	Q49	D - 2		
D11	F - 2	Q50	D - 3		
D12	G - 3	Q51	E - 3		
D14	C - 1	Q52	E - 3		
D15	B - 3	Q53	E - 2		
D16	F - 3	Q54	F - 3		
D17	G - 3	Q55	G - 2		
D18	G - 1	Q56	G - 2		
D19	G - 2	Q57	H - 2		
D28	C - 1	Q58	H - 3		
		Q59	H - 2		
DL1	B - 3	Q61	H - 2		
DL2	B - 2	Q62	A - 3		
DL3	B - 3	Q63	B - 3		
DL4	E - 1	Q64	A - 2		
		Q65	A - 2		
IC1	B - 3	Q66	A - 2		
IC2	C - 3	Q67	A - 1		
IC3	E - 3	Q68	A - 1		
IC4	G - 3	Q69	A - 1		
IC5	B - 2	Q70	E - 1		
IC6	C - 2	Q71	F - 1		
IC7	E - 1	Q72	G - 1		
IC8	G - 1	Q73	F - 1		
IC9	B - 2	Q74	C - 1		
IC10	C - 2	Q75	H - 3		
IC11	E - 2	Q76	H - 1		
IC12	G - 2	Q77	H - 2		
IC13	G - 1	Q78	A - 3		
JR1	C - 3	RV1	B - 3		
JR2	D - 1	RV2	C - 3		
JR3	C - 2	RV3	D - 3		
JR5	B - 2	RV4	F - 3		
JR6	G - 2	RV5	B - 1		
JR7	E - 1	RV7	D - 2		
JR8	A - 3	RV8	F - 3		
JR9	H - 3	RV9	F - 1		
JR10	H - 1	RV10	C - 3		
JR11	H - 2	RV11	D - 2		
JR12	A - 2	RV12	G - 3		
JR13	A - 2	RV13	F - 2		
		RV15	A - 3		
Q1	A - 3	RV16	A - 3		
Q2	B - 3	RV17	A - 2		
Q3	B - 3	RV18	A - 2		
Q4	C - 3	RV19	A - 1		
Q5	D - 3	RV20	A - 2		
Q6	D - 3	RV22	H - 3		
Q7	D - 3	RV23	G - 3		
Q8	D - 3	RV24	H - 3		
Q9	E - 3	RV25	D - 3		
Q10	E - 3	RV26	D - 3		
Q11	F - 3	RV27	D - 3		
Q12	F - 3	RV31	F - 1		
Q13	G - 3	RV32	G - 3		
Q14	G - 3	RV33	C - 3		
Q15	H - 3	RV34	B - 2		
Q16	H - 3				
Q17	H - 3	S1	A - 3		
Q19	H - 3	S3	F - 1		
Q21	B - 1	S4	F - 1		
Q22	C - 1				
Q23	A - 1	TH1	D - 3		
Q24	A - 2	TH3	D - 2		
Q25	B - 1	TH5	D - 2		

C-27

F

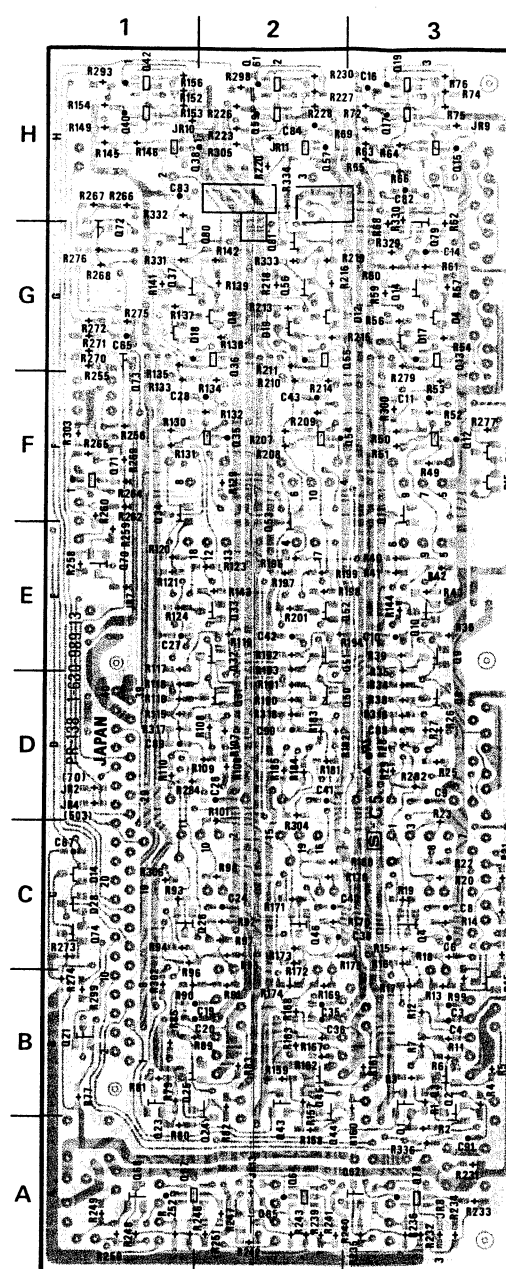
G

H

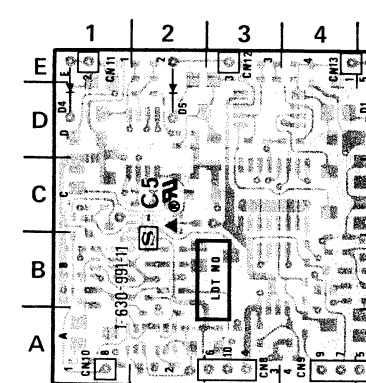
C-28

I

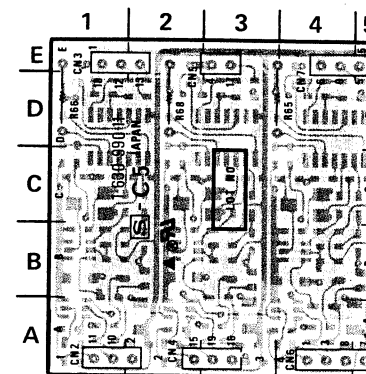
J



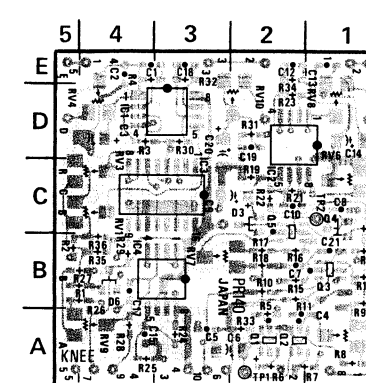
1-630-989-13, 14 SOLDERING SIDE



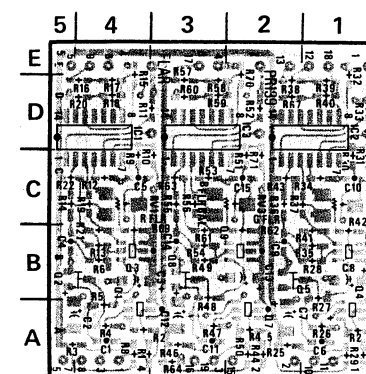
1-630-991-11 SOLDERING SIDE



1-630-990-11 SOLDERING SIDE



1-630-991-11 SOLDERING SIDE



1-630-990-11 SOLDERING SIDE

PR-140 (1-630-991-11)

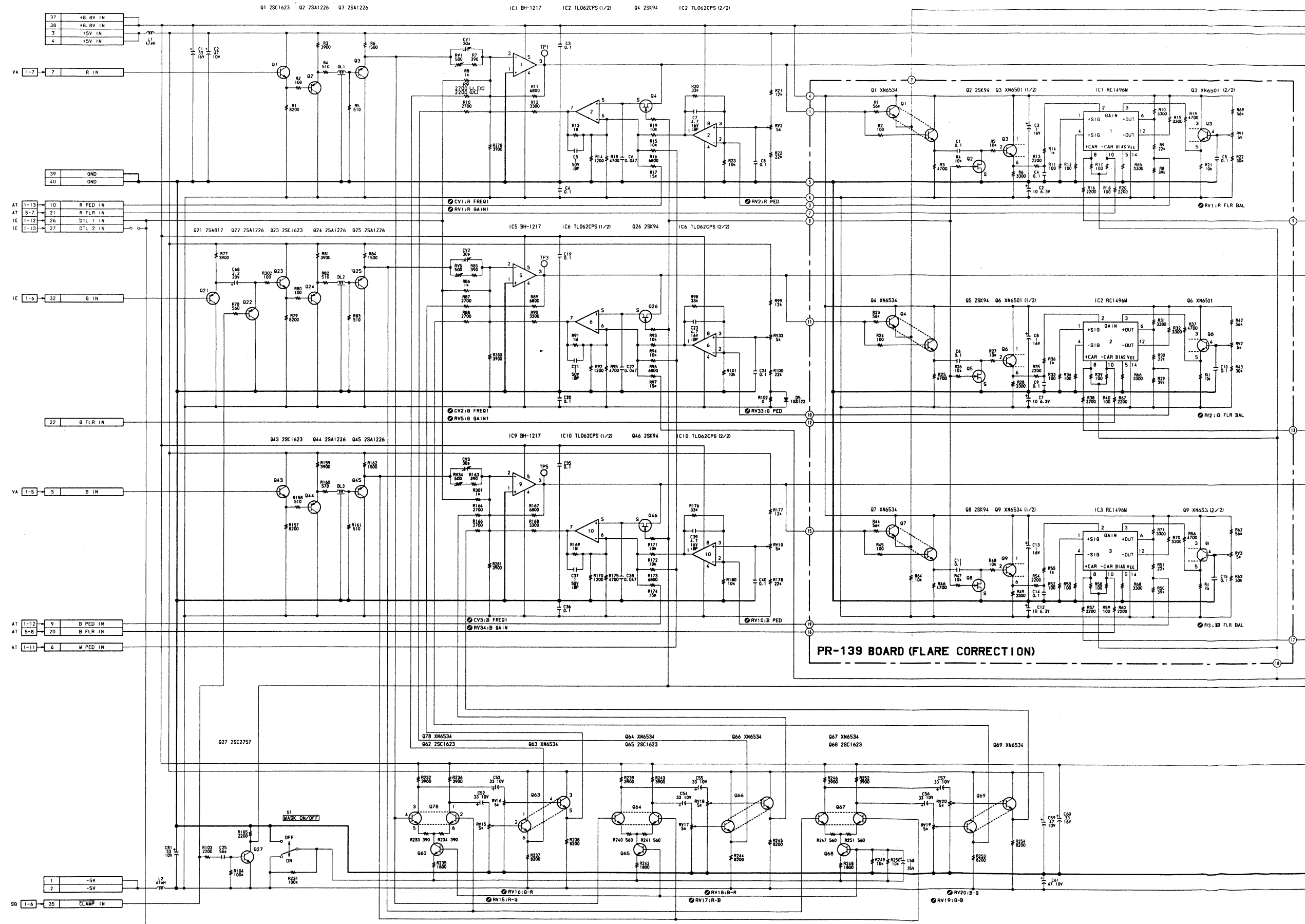
CN8	A - 3
CN9	A - 4
CN10	A - 1
CN11	E - 1
CN12	E - 3
CN13	E - 4
D1	D - 5
D3	C - 2
D4	D - 1
D5	D - 2
D6	B - 4
IC1	D - 4
IC2	C - 2
IC3	C - 3
IC4	B - 4
Q1	A - 2
Q2	A - 2
Q3	B - 1
Q4	C - 1
Q5	C - 2
RV1	C - 4
RV3	C - 4
RV4	D - 5
RV5	A - 1
RV6	D - 1
RV7	B - 3
RV8	D - 1
RV9	A - 4
RV10	D - 2
TP1	A - 2
TP2	C - 1

PR-139 (1-630-990-11)

CN2	A - 1
CN3	E - 1
CN4	A - 2
CN5	D - 2
CN6	A - 4
CN7	D - 4
IC1	D - 4
IC2	D - 1
IC3	D - 2
Q1	B - 4
Q2	B - 5
Q3	B - 4
Q4	B - 1
Q5	B - 1
Q6	B - 1
Q7	A - 2
Q8	B - 3
Q9	B - 3
RV1	C - 3
RV2	C - 1
RV3	C - 2

BVP-7A (J, UC)
BVP-7AP (EK)

PR-138D/E (1/2) BOARD
PR-139 BOARD



BVP-7A (J, UC)
BVP-7AP (EK)
B-BVP7A-PR138/M#1

C-29-1

C-30-1

A

B

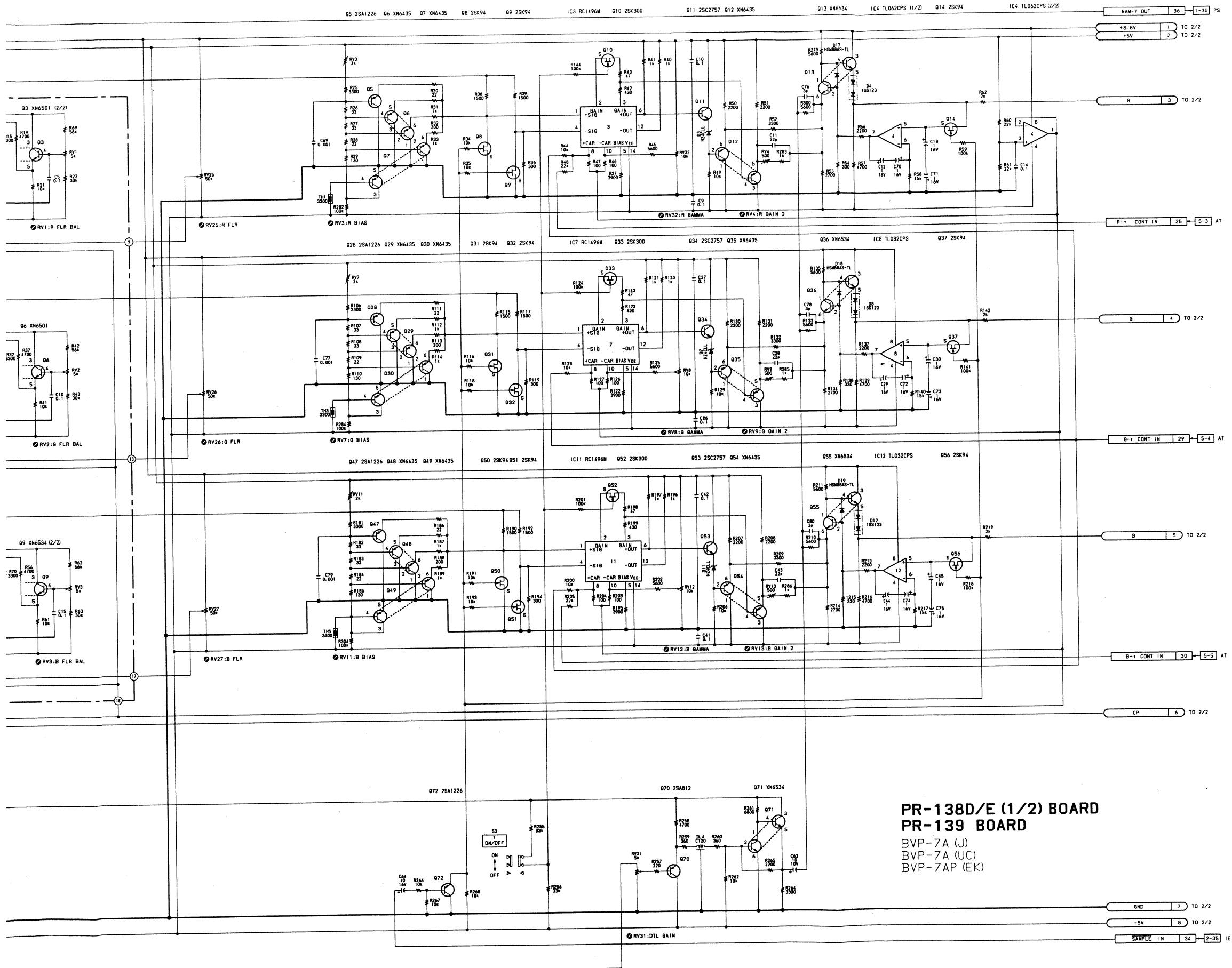
C

D

E

F

G



C-31-1

C-32-1

G

H

I

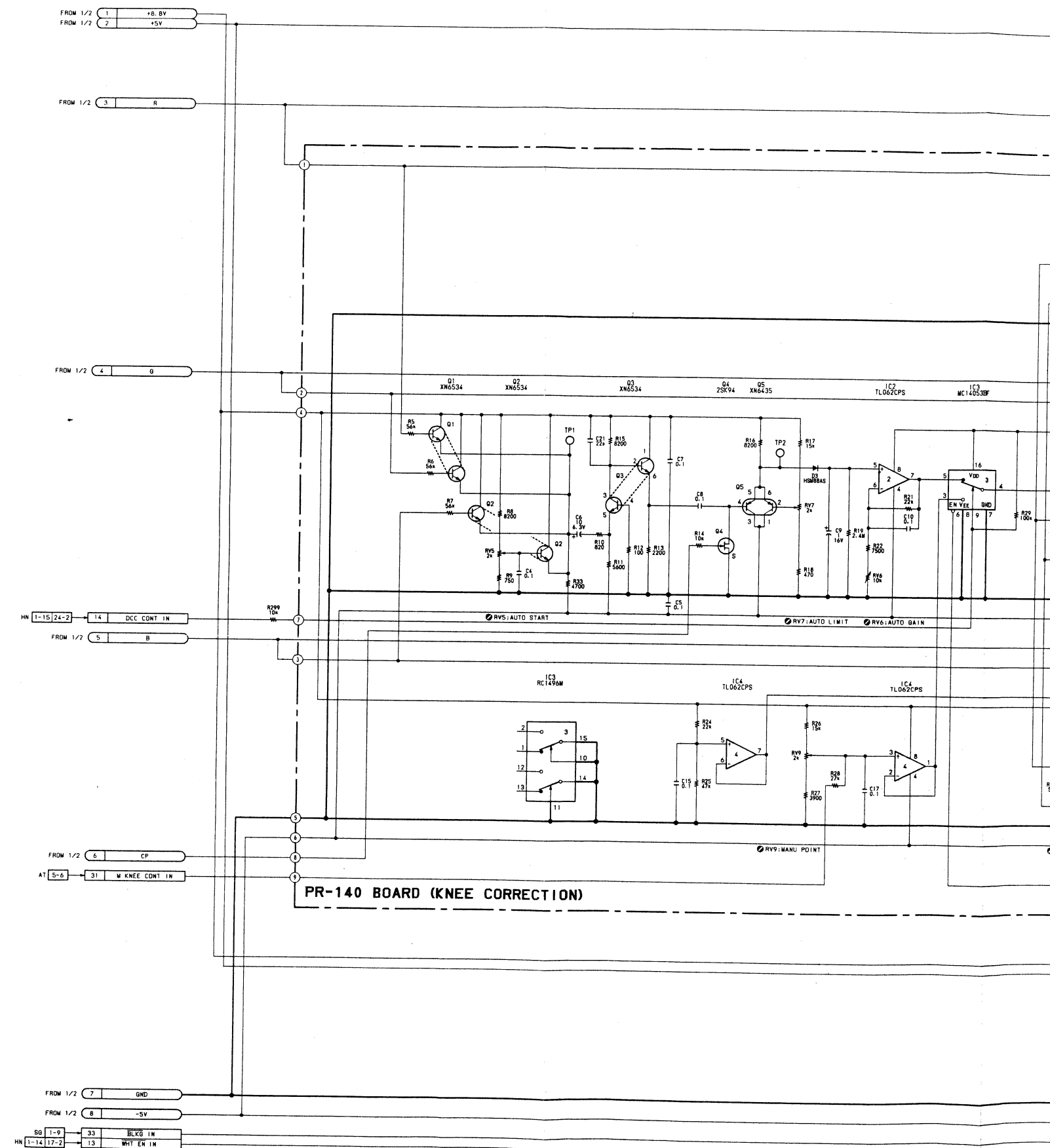
J

K

L

M

PR-138D/E (2/2) BOARD
PR-140 BOARD

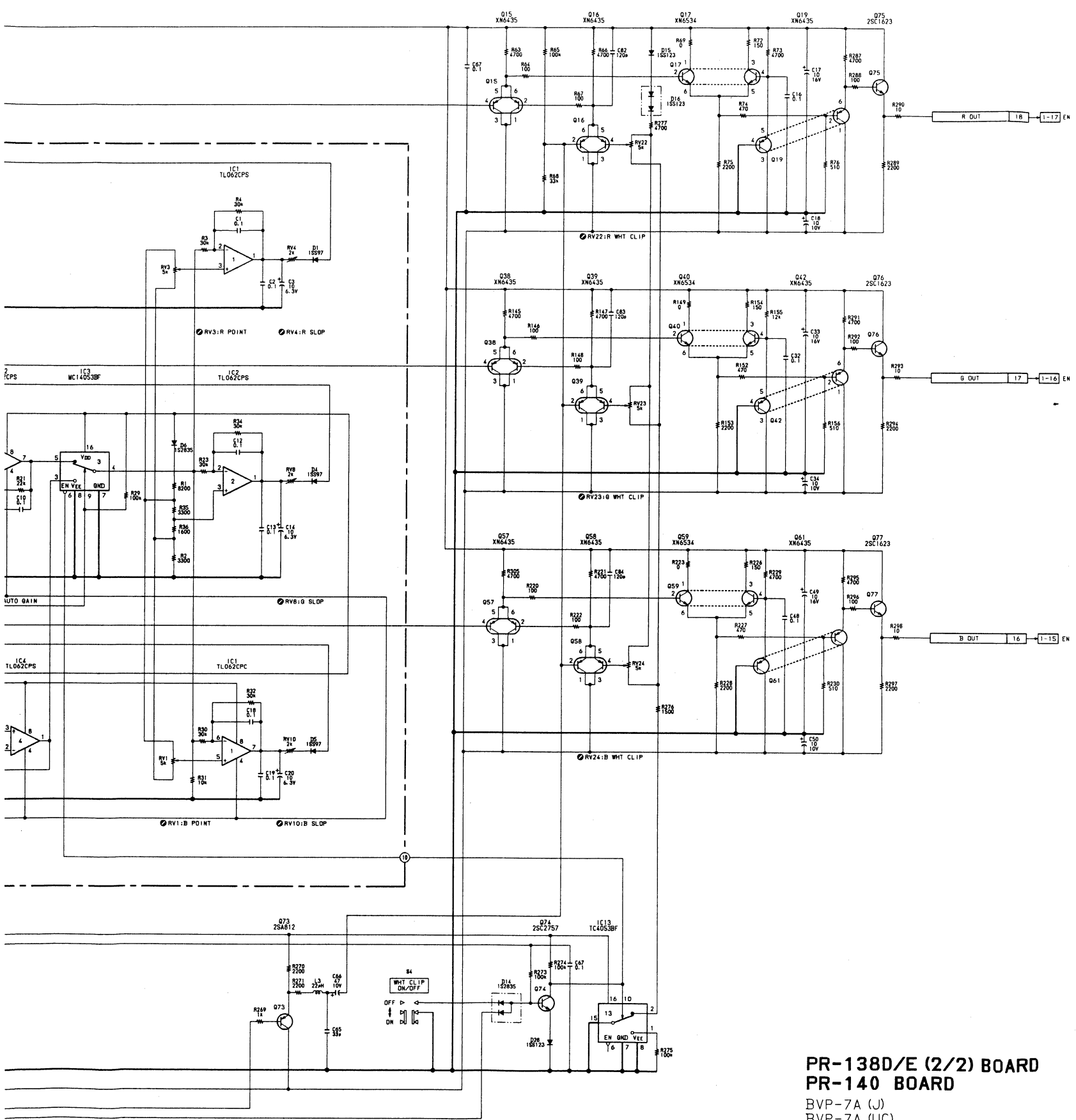


BVP-7A (J, UC)
BVP-7AP (EK)
B-BVP7A-PR138/M#2

C-29-2
B

C-30-2

1
2
3
4
5
6



PR-138D/E (2/2) BOARD
PR-140 BOARD
BVP-7A (J)
BVP-7A (UC)
BVP-7AP (EK)

C-31-2

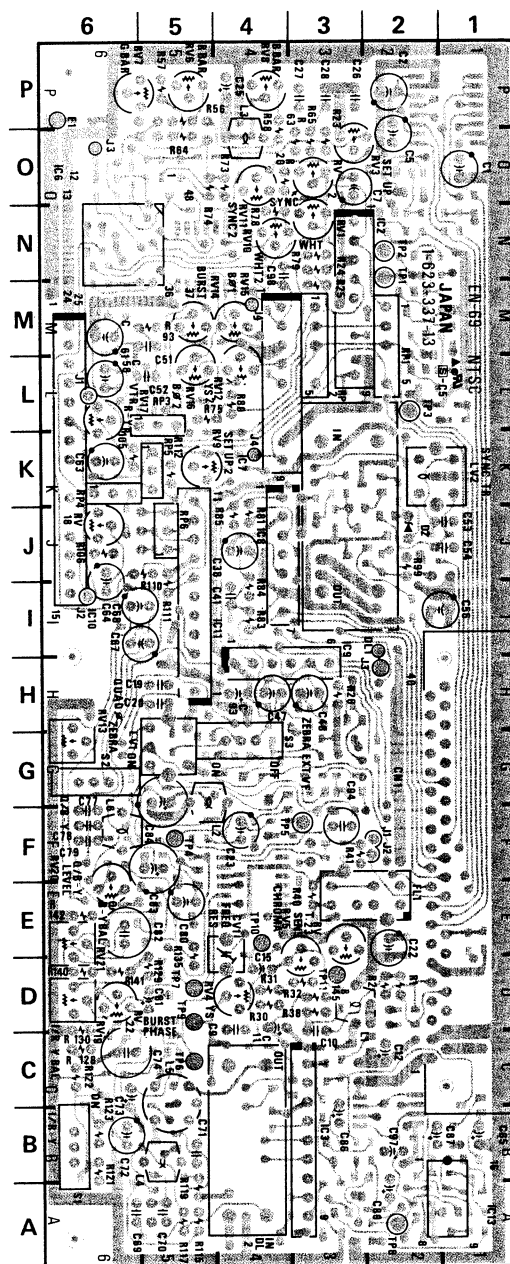
C-32-2

G | | H | | I | | J | | K | | L | | M

EN-69 BOARD

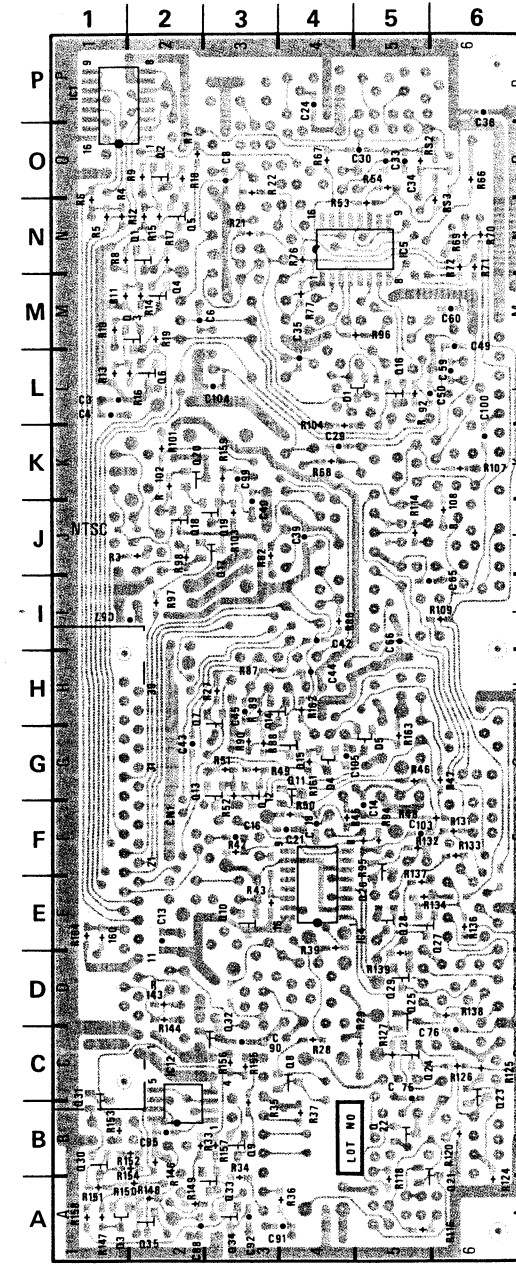
EN-69 (1-623-337-13)

CN1	F-1	RV1	N-3
CV11	E-4	RV2	O-3
D1	L-5	RV3	O-3
D2	J-2	RV4	D-4
D3	A-1	RV5	D-3
D4	G-4	RV6	P-5
D5	G-5	RV7	P-6
DL1	J-3	RV8	P-4
DL2	B-4	RV9	K-5
E1	P-6	RV10	N-4
FL1	E-2	RV11	O-4
IC1	P-1	RV12	L-4
IC2	M-3	RV13	G-6
IC3	B-3	RV14	M-5
IC4	E-4	RV15	M-4
IC5	N-4	RV16	L-5
IC6	N-6	RV17	L-6
IC7	L-4	RV18	J-6
IC8	J-4	RV19	D-6
IC9	H-4	RV20	E-6
IC10	K-6	RV21	E-6
IC11	I-5	RV22	D-6
IC12	B-2	RV23	E-3
IC13	A-1		
LV1	G-5	S1	B-6
LV2	K-1	S2	G-6
		S3	G-4
Q1	N-2	TP1	N-2
Q2	O-2	TP2	N-2
Q3	M-2	TP3	L-2
Q4	M-2	TP4	F-5
Q5	N-2	TP5	F-3
Q6	L-2	TP6	C-5
Q7	H-3	TP7	D-5
Q8	C-4	TP8	A-2
Q9	B-3	TP9	D-5
Q10	E-3	TP10	E-4
Q11	G-4	TP11	D-3
Q12	G-3		
Q13	G-3		
Q14	H-3		
Q15	G-4		
Q16	L-5		
Q17	J-3		
Q18	J-2		
Q19	J-3		
Q20	K-2		
Q21	A-5		
Q22	B-5		
Q23	C-6		
Q24	C-5		
Q25	D-5		
Q26	F-5		
Q27	E-5		
Q28	E-5		
Q29	D-5		
Q30	B-1		
Q31	C-1		
Q32	C-3		
Q33	A-3		
Q34	A-3		
Q35	A-2		
RP1	M-6		
RP2	M-3		
RP3	L-5		
RP4	K-6		
RP5	K-5		
RP6	J-5		



1-623-337-13 SOLDERING SIDE

C-33



1-623-337-13 SOLDERING SIDE

C-34

EN-69 (1-623-337-13)

CN1	F-1	RV1	N-3
CV11	E-4	RV2	O-3
D1	L-5	RV3	O-3
D2	J-2	RV4	D-4
D3	A-1	RV5	D-3
D4	G-4	RV6	P-5
D5	G-5	RV7	P-6
DL1	J-3	RV8	P-4
DL2	B-4	RV9	K-5
E1	P-6	RV10	N-4
FL1	E-2	RV11	O-4
IC1	P-1	RV12	L-4
IC2	M-3	RV13	G-6
IC3	B-3	RV14	M-5
IC4	E-4	RV15	M-4
IC5	N-4	RV16	L-5
IC6	N-6	RV17	L-6
IC7	L-4	RV18	J-6
IC8	J-4	RV19	D-6
IC9	H-4	RV20	E-6
IC10	K-6	RV21	E-6
IC11	I-5	RV22	D-6
IC12	B-2	RV23	E-3
IC13	A-1		
LV1	G-5	S1	B-6
LV2	K-1	S2	G-6
		S3	G-4
Q1	N-2	TP1	N-2
Q2	O-2	TP2	N-2
Q3	M-2	TP3	L-2
Q4	M-2	TP4	F-5
Q5	N-2	TP5	F-3
Q6	L-2	TP6	C-5
Q7	H-3	TP7	D-5
Q8	C-4	TP8	A-2
Q9	B-3	TP9	D-5
Q10	E-3	TP10	E-4
Q11	G-4	TP11	D-3
Q12	G-3		
Q13	G-3		
Q14	H-3		
Q15	G-4		
Q16	L-5		
Q17	J-3		
Q18	J-2		
Q19	J-3		
Q20	K-2		
Q21	A-5		
Q22	B-5		
Q23	C-6		
Q24	C-5		
Q25	D-5		
Q26	F-5		
Q27	E-5		
Q28	E-5		
Q29	D-5		
Q30	B-1		
Q31	C-1		
Q32	C-3		
Q33	A-3		
Q34	A-3		
Q35	A-2		
RP1	M-6		
RP2	M-3		
RP3	L-5		
RP4	K-6		
RP5	K-5		
RP6	J-5		

EN-69P

EN-69P (1-623-337-13)

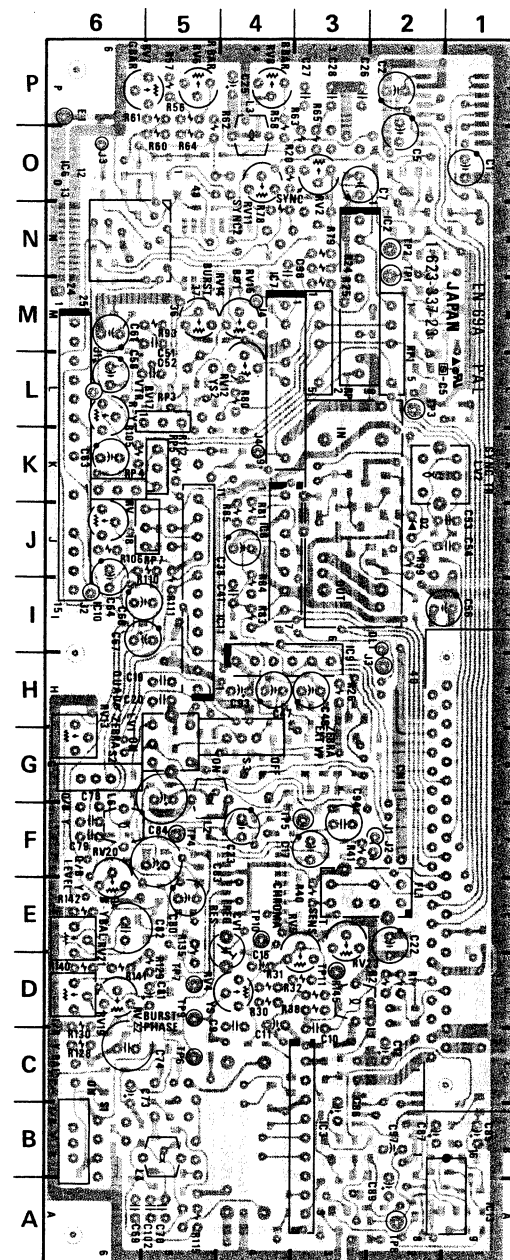
CN1	F-1	RV1	N-3
CV11	E-4	RV2	O-3
D1	L-5	RV3	O-3
D2	J-2	RV4	D-4
D3	A-1	RV5	D-3
D4	G-4	RV6	P-5
D5	G-5	RV7	P-6
DL1	J-3	RV8	P-4
DL2	B-4	RV9	K-5
E1	P-6	RV10	N-4
FL1	E-2	RV11	O-4
IC1	P-1	RV12	L-4
IC2	M-3	RV13	G-6
IC3	B-3	RV14	M-5
IC4	E-4	RV15	M-4
IC5	N-4	RV16	L-5
IC6	N-6	RV17	L-6
IC7	L-4	RV18	J-6
IC8	J-4	RV19	D-6
IC9	H-4	RV20	E-6
IC10	K-6	RV21	E-6
IC11	I-5	RV22	D-6
IC12	B-2	RV23	E-3
IC13	A-1		
LV1	G-5	S1	B-6
LV2	K-1	S2	G-6
		S3	G-4
Q1	N-2	TP1	N-2
Q2	O-2	TP2	N-2
Q3	M-2	TP3	L-2
Q4	M-2	TP4	F-5
Q5	N-2	TP5	F-3
Q6	L-2	TP6	C-5
Q7	H-3	TP7	D-5
Q8	C-4	TP8	A-2
Q9	B-3	TP9	D-5
Q10	E-3	TP10	E-4
Q11	G-4	TP11	D-3
Q12	G-3		
Q13	G-3		
Q14	H-3		
Q15	G-4		
Q16	L-5		
Q17	J-3		
Q18	J-2		
Q19	J-3		
Q20	K-2		
Q21	A-5		
Q22	B-5		
Q23	C-6		
Q24	C-5		
Q25	D-5		
Q26	F-5		
Q27	E-5		
Q28	E-5		
Q29	D-5		
Q30	B-1		
Q31	C-1		
Q32	C-3		
Q33	A-3		
Q34	A-3		
Q35	A-2		
RP1	M-6		
RP2	M-3		
RP3	L-5		
RP4	K-6		
RP5	K-5		
RP6	J-5		

G

EN-69P BOARD

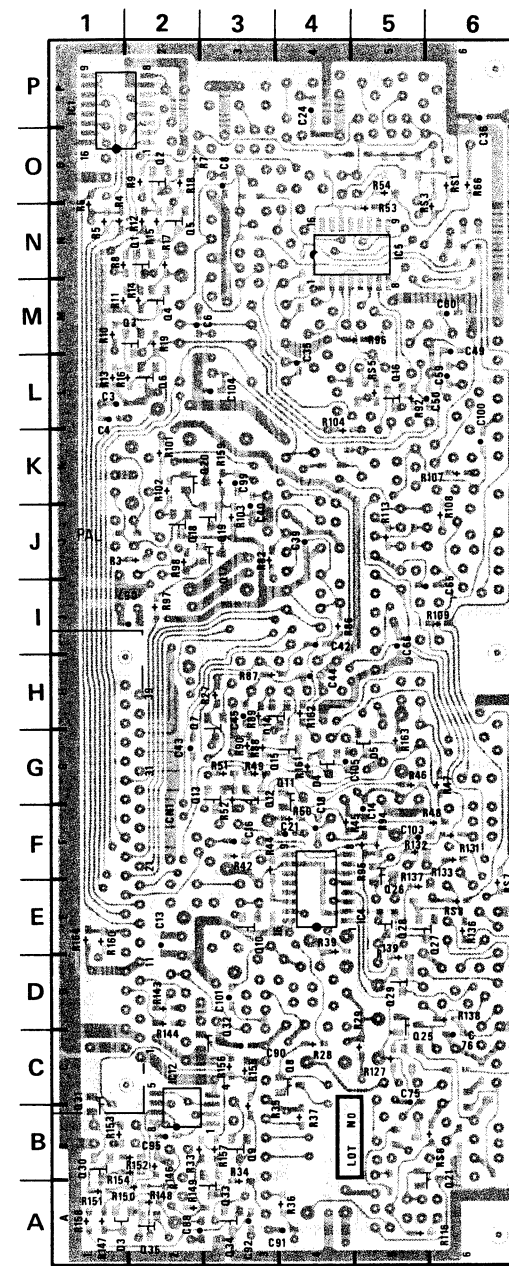
EN-69P (1-623-337-23)

CN1	F-1	RV1	N-3
CV11	E-4	RV2	O-3
		RV3	O-3
		RV4	D-4
D1	L-5	RV5	D-3
D2	J-2	RV6	P-5
D3	A-1	RV7	P-6
D4	G-4	RV8	P-4
D5	G-5	RV9	K-5
		RV10	N-4
DL1	J-3	RV11	O-4
DL2	B-4	RV12	L-4
		RV13	G-6
E1	P-6	RV14	M-5
		RV15	M-4
FL1	E-2	RV16	L-5
		RV17	L-6
IC1	P-1	RV18	J-6
IC2	M-3	RV19	D-6
IC3	B-3	RV20	E-6
IC4	E-4	RV21	E-6
IC5	N-4	RV22	D-6
IC6	N-6	RV23	E-3
IC7	L-4		
IC8	J-4	S1	B-6
IC9	H-4	S2	G-6
IC10	K-6	S3	G-4
IC11	I-5		
IC12	B-2	TP1	N-2
IC13	A-1	TP2	N-2
		TP3	L-2
LV1	G-5	TP4	F-5
LV2	K-1	TP5	F-3
		TP6	C-5
Q1	N-2	TP7	D-5
Q2	O-2	TP8	A-2
Q3	M-2	TP9	D-5
Q4	M-2	TP10	E-4
Q5	N-2	TP11	D-3
Q6	L-2		
Q7	H-3		
Q8	C-4		
Q9	B-3		
Q10	E-3		
Q11	G-4		
Q12	G-3		
Q13	G-3		
Q14	H-3		
Q15	G-4		
Q16	L-5		
Q17	J-3		
Q18	J-2		
Q19	J-3		
Q20	K-2		
Q21	A-5		
Q22	B-5		
Q23	C-6		
Q24	C-5		
Q25	D-5		
Q26	F-5		
Q27	E-5		
Q28	E-5		
Q29	D-5		
Q30	B-1		
Q31	C-1		
Q32	C-3		
Q33	A-3		
Q34	A-3		
Q35	A-2		
RP1	M-6		
RP2	M-3		
RP3	L-5		
RP4	K-6		
RP5	K-5		
RP6	J-5		



1-623-337-23 SOLDERING SIDE

C-35



1-623-337-23 SOLDERING SIDE

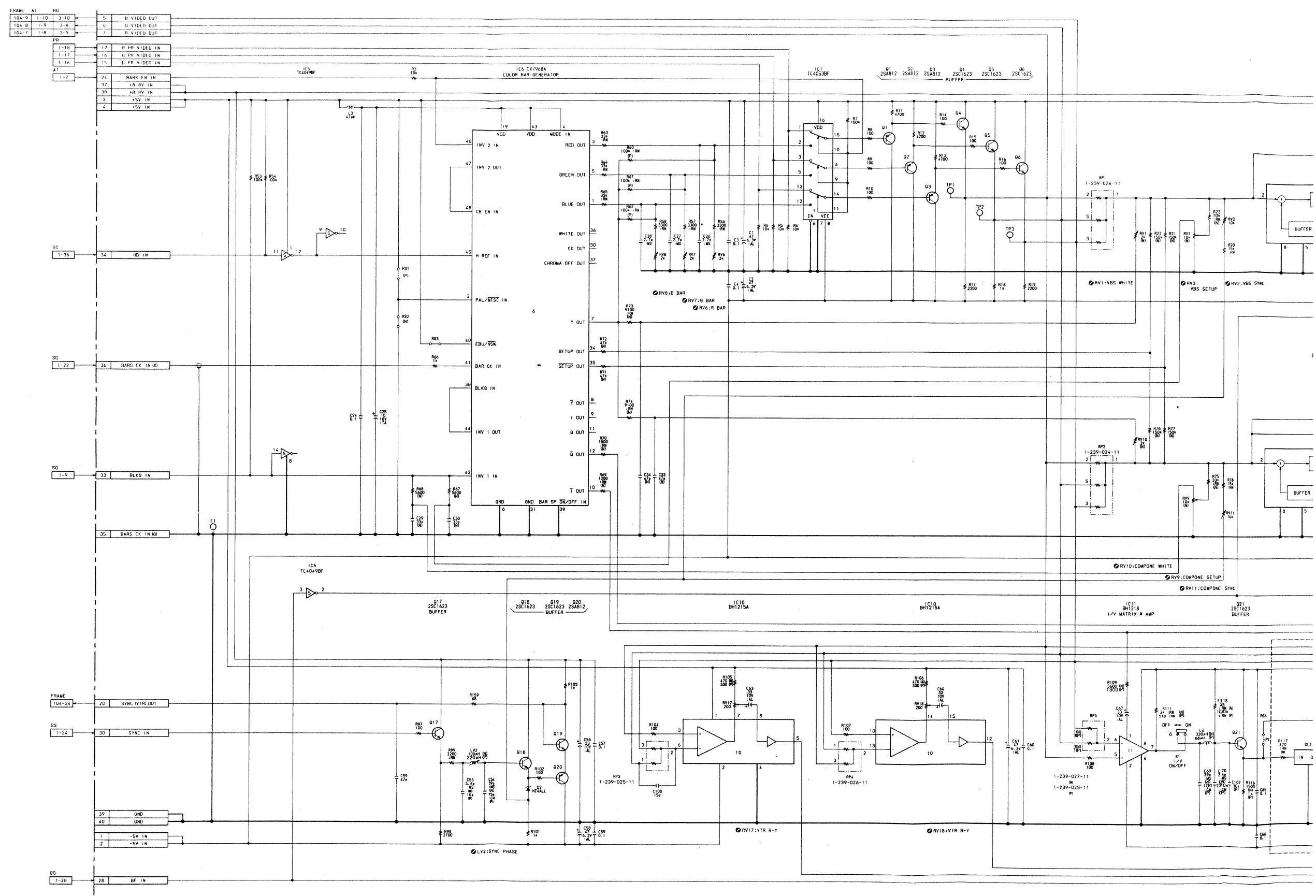
C-36

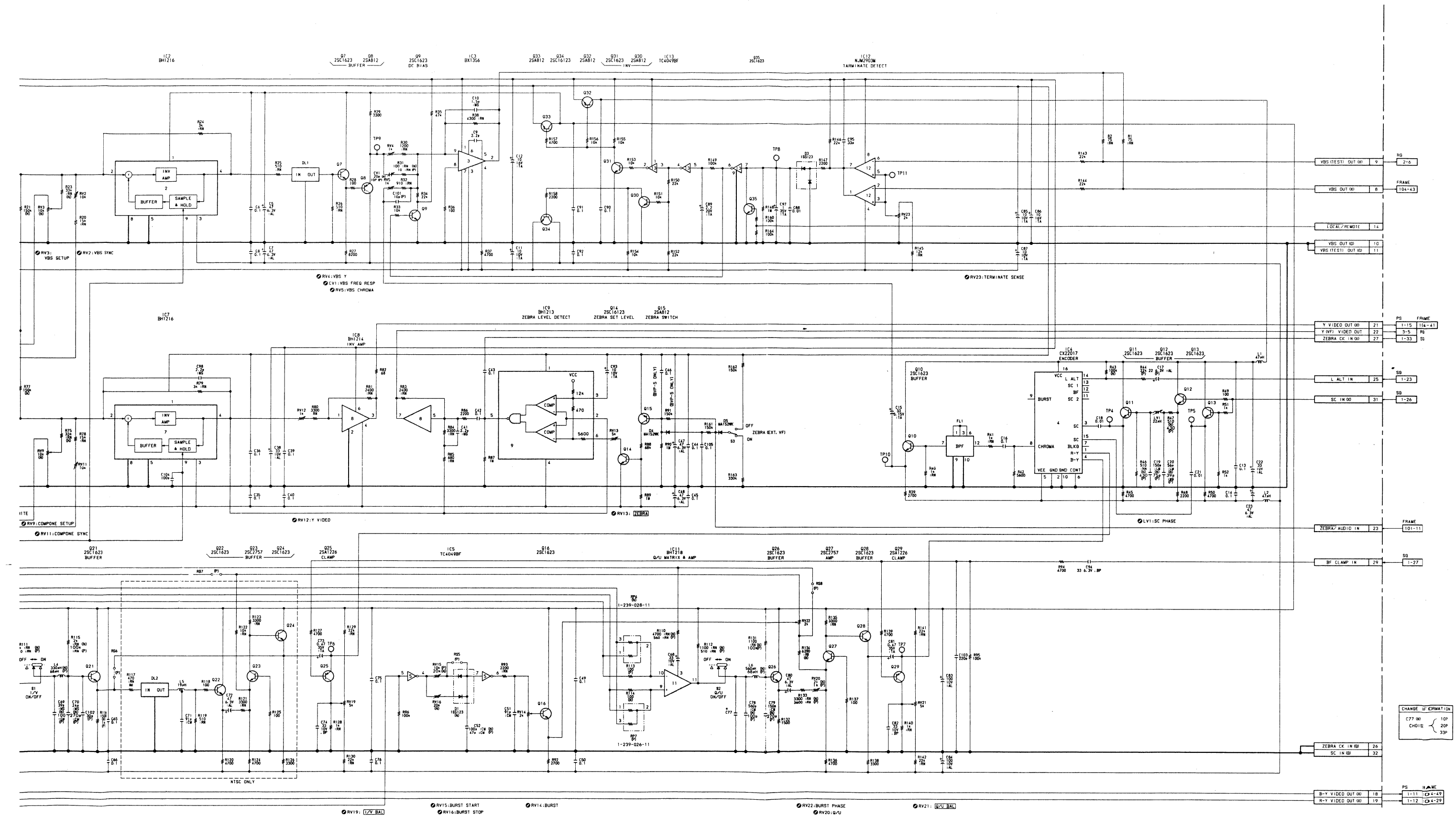
EN-69P (1-623-337-23)

CN1	F-1	RV1	N-3
CV11	E-4	RV2	O-3
		RV3	O-3
		RV4	D-4
D1	L-5	RV5	D-3
D2	J-2	RV6	P-5
D3	A-1	RV7	P-6
D4	G-4	RV8	P-4
D5	G-5	RV9	K-5
		RV10	N-4
DL1	J-3	RV11	O-4
DL2	B-4	RV12	L-4
		RV13	G-6
E1	P-6	RV14	M-5
		RV15	M-4
FL1	E-2	RV16	L-5
		RV17	L-6
IC1	P-1	RV18	J-6
IC2	M-3	RV19	D-6
IC3	B-3	RV20	E-6
IC4	E-4	RV21	E-6
IC5	N-4	RV22	D-6
IC6	N-6	RV23	E-3
IC7	L-4		
IC8	J-4	S1	B-6
IC9	H-4	S2	G-6
IC10	K-6	S3	G-4
IC11	I-5		
IC12	B-2	TP1	N-2
IC13	A-1	TP2	N-2
		TP3	L-2
LV1	G-5	TP4	F-5
LV2	K-1	TP5	F-3
		TP6	C-5
Q1	N-2	TP7	D-5
Q2	O-2	TP8	A-2
Q3	M-2	TP9	D-5
Q4	M-2	TP10	E-4
Q5	N-2	TP11	D-3
Q6	L-2		
Q7	H-3		
Q8	C-4		
Q9	B-3		
Q10	E-3		
Q11	G-4		
Q12	G-3		
Q13	G-3		
Q14	H-3		
Q15	G-4		
Q16	L-5		
Q17	J-3		
Q18	J-2		
Q19	J-3		
Q20	K-2		
Q21	A-5		
Q22	B-5		
Q23	C-6		
Q24	C-5		
Q25	D-5		
Q26	F-5		
Q27	E-5		
Q28	E-5		
Q29	D-5		
Q30	B-1		
Q31	C-1		
Q32	C-3		
Q33	A-3		
Q34	A-3		
Q35	A-2		
RP1	M-6		
RP2	M-3		
RP3	L-5		
RP4	K-6		
RP5	K-5		
RP6	J-5		

BVP-7A (J, UC)
BVP-7AP (EK)

M





EN-69/69P BOARD

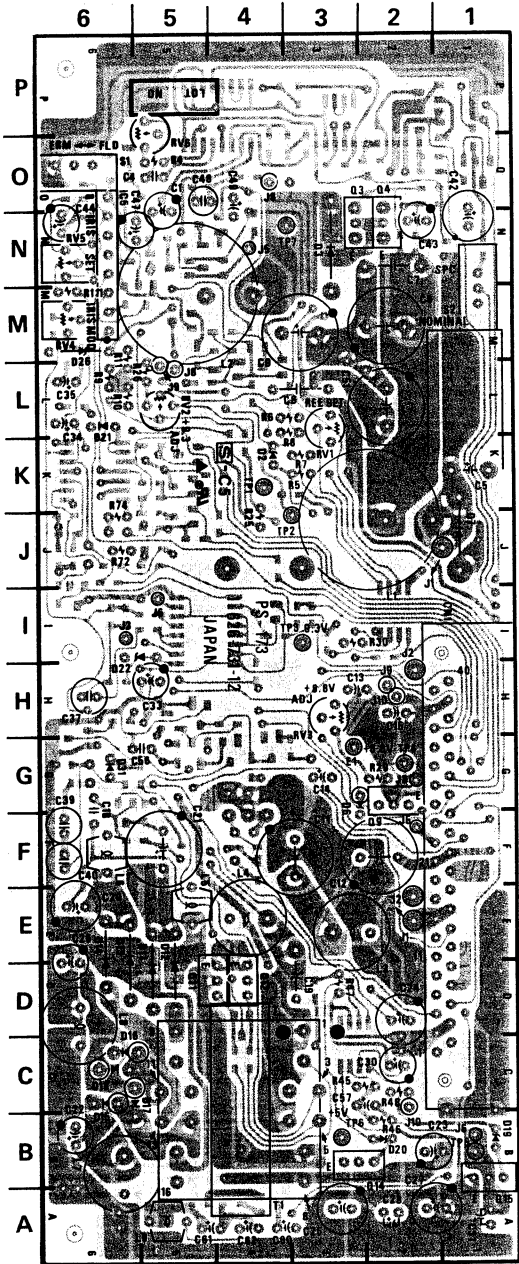
BVP-7A (J)
BVP-7A (UC)
BVP-7AP (EK)

CN1	F - 1
D2	K - 4
D3	N - 3
D4	A - 4
D5	G - 4
D6	G - 3
D7	J - 1
D9	D - 4
D10	G - 4
D11	D - 5
D12	D - 5
D13	E - 6
D14	D - 6
D15	C - 6
D16	C - 6
D17	C - 6
D18	C - 6
D19	B - 1
D20	B - 2
D21	L - 6
D22	I - 5
D23	N - 5
D24	N - 5
D26	M - 6
D27	O - 6
D28	I - 6
D31	G - 6
E1	G - 3
IC1	P - 4
IC2	I - 2
IC3	C - 3
IC4	K - 5
IC5	N - 6
IC6	P - 3
IC7	N - 6
Q3	N - 2
Q4	N - 2
Q8	H - 5
Q9	G - 2
Q10	F - 6
Q11	D - 5
Q12	D - 4
Q13	G - 5
Q14	B - 3
Q15	A - 1
Q17	K - 5
Q18	J - 5
Q19	K - 5
Q21	M - 5
Q22	I - 4
Q23	M - 5
Q24	L - 4
Q26	N - 4
Q27	N - 5
Q28	O - 2
Q29	O - 1
Q31	L - 4
Q34	G - 4
Q35	P - 2
RV1	L - 3
RV2	L - 5
RV3	H - 3
RV4	M - 6
RV5	N - 6
RV6	P - 5
S1	O - 6
S2	M - 1
T1	B - 4
TP1	K - 4
TP2	J - 3
TP3	I - 3
TP4	G - 2
TP5	B - 1
TP6	B - 3
TP7	N - 4

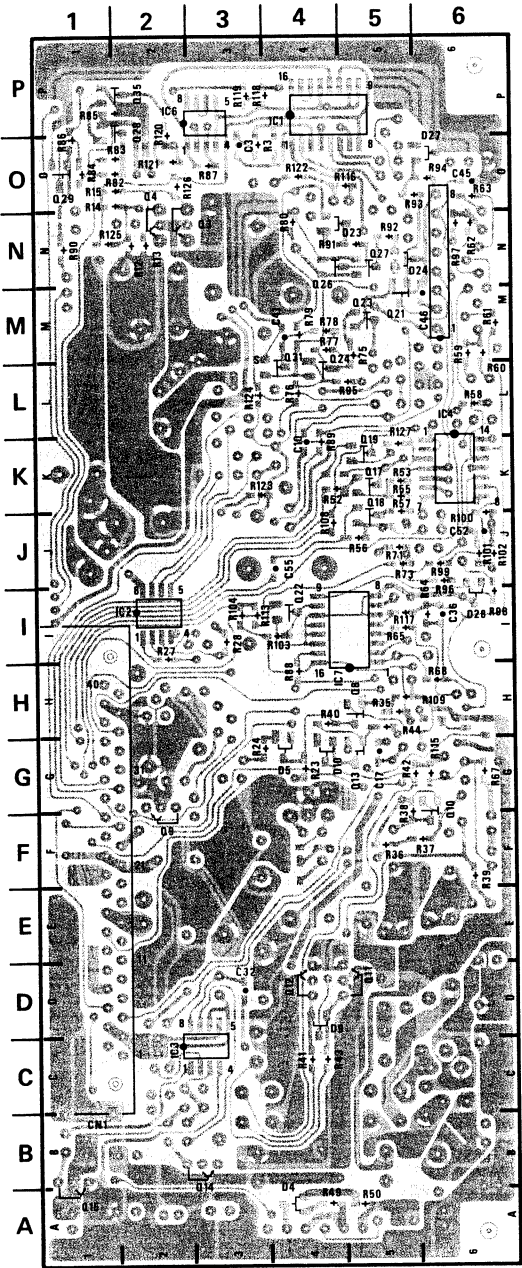
PS-173 BOARD

PS-173 (1-626-731-12)

- | | |
|-----|-------|
| CN1 | F - 1 |
| D2 | K - 4 |
| D3 | N - 3 |
| D4 | A - 4 |
| D5 | G - 4 |
| D6 | G - 3 |
| D7 | J - 1 |
| D9 | D - 4 |
| D10 | G - 4 |
| D11 | D - 5 |
| D12 | D - 5 |
| D13 | E - 6 |
| D14 | D - 6 |
| D15 | C - 6 |
| D16 | C - 6 |
| D17 | C - 6 |
| D18 | C - 6 |
| D19 | B - 1 |
| D20 | B - 2 |
| D21 | L - 6 |
| D22 | I - 5 |
| D23 | N - 5 |
| D24 | N - 5 |
| D26 | M - 6 |
| D27 | O - 6 |
| D28 | I - 6 |
| D31 | G - 6 |
| E1 | G - 3 |
| IC1 | P - 4 |
| IC2 | I - 2 |
| IC3 | C - 3 |
| IC4 | K - 5 |
| IC5 | N - 6 |
| IC6 | P - 3 |
| IC7 | N - 6 |
| Q3 | N - 2 |
| Q4 | N - 2 |
| Q8 | H - 5 |
| Q9 | G - 2 |
| Q10 | F - 6 |
| Q11 | D - 5 |
| Q12 | D - 4 |
| Q13 | G - 5 |
| Q14 | B - 3 |
| Q15 | A - 1 |
| Q17 | K - 5 |
| Q18 | J - 5 |
| Q19 | K - 5 |
| Q21 | M - 5 |
| Q22 | I - 4 |
| Q23 | M - 5 |
| Q24 | L - 4 |
| Q26 | N - 4 |
| Q27 | N - 5 |
| Q28 | O - 2 |
| Q29 | O - 1 |
| Q31 | L - 4 |
| Q34 | G - 4 |
| Q35 | P - 2 |
| RV1 | L - 3 |
| RV2 | L - 5 |
| RV3 | H - 3 |
| RV4 | M - 6 |
| RV5 | N - 6 |
| RV6 | P - 5 |
| S1 | O - 6 |
| S2 | M - 1 |
| T1 | B - 4 |
| TP1 | K - 4 |
| TP2 | J - 3 |
| TP3 | I - 3 |
| TP4 | G - 2 |
| TP5 | B - 1 |
| TP6 | B - 3 |
| TP7 | N - 4 |



1-626-731-12 SOLDERING SIDE

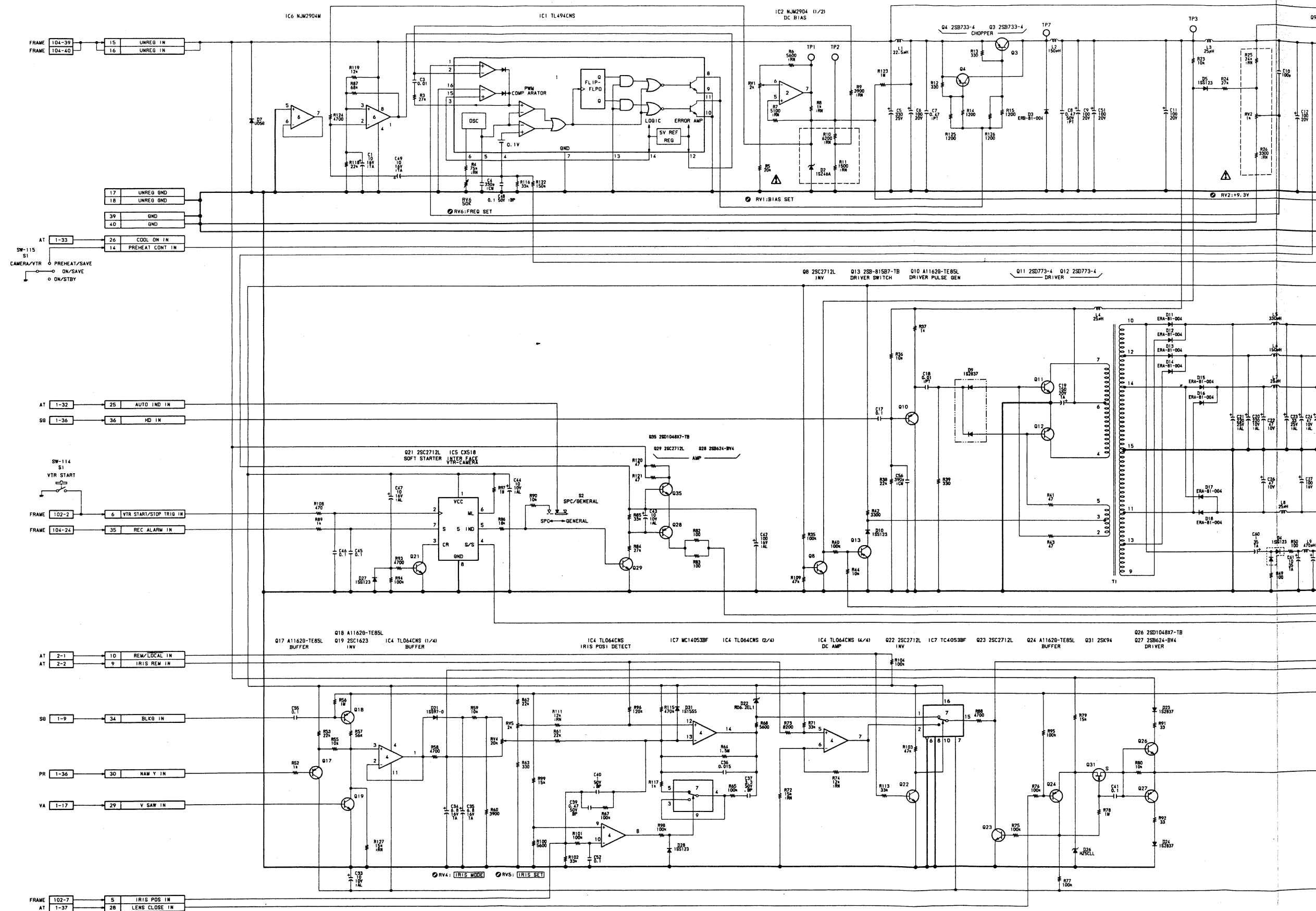


1-626-731-12 SOLDERING SIDE

PS-173 (1-626-731-12)

- | | |
|-----|-------|
| CN1 | F - 1 |
| D2 | K - 4 |
| D3 | N - 3 |
| D4 | A - 4 |
| D5 | G - 4 |
| D6 | G - 3 |
| D7 | J - 1 |
| D9 | D - 4 |
| D10 | G - 4 |
| D11 | D - 5 |
| D12 | D - 5 |
| D13 | E - 6 |
| D14 | D - 6 |
| D15 | C - 6 |
| D16 | C - 6 |
| D17 | C - 6 |
| D18 | C - 6 |
| D19 | B - 1 |
| D20 | B - 2 |
| D21 | L - 6 |
| D22 | I - 5 |
| D23 | N - 5 |
| D24 | N - 5 |
| D26 | M - 6 |
| D27 | O - 6 |
| D28 | I - 6 |
| D31 | G - 6 |
| E1 | G - 3 |
| IC1 | P - 4 |
| IC2 | I - 2 |
| IC3 | C - 3 |
| IC4 | K - 5 |
| IC5 | N - 6 |
| IC6 | P - 3 |
| IC7 | N - 6 |
| Q3 | N - 2 |
| Q4 | N - 2 |
| Q8 | H - 5 |
| Q9 | G - 2 |
| Q10 | F - 6 |
| Q11 | D - 5 |
| Q12 | D - 4 |
| Q13 | G - 5 |
| Q14 | B - 3 |
| Q15 | A - 1 |
| Q17 | K - 5 |
| Q18 | J - 5 |
| Q19 | K - 5 |
| Q21 | M - 5 |
| Q22 | I - 4 |
| Q23 | M - 5 |
| Q24 | L - 4 |
| Q26 | N - 4 |
| Q27 | N - 5 |
| Q28 | O - 2 |
| Q29 | O - 1 |
| Q31 | L - 4 |
| Q34 | G - 4 |
| Q35 | P - 2 |
| RV1 | L - 3 |
| RV2 | L - 5 |
| RV3 | H - 3 |
| RV4 | M - 6 |
| RV5 | N - 6 |
| RV6 | P - 5 |
| S1 | O - 6 |
| S2 | M - 1 |
| T1 | B - 4 |
| TP1 | K - 4 |
| TP2 | J - 3 |
| TP3 | I - 3 |
| TP4 | G - 2 |
| TP5 | B - 1 |
| TP6 | B - 3 |
| TP7 | N - 4 |

PS-173 BOARD
POWER SUPPLY CIRCUIT



BVP-7A (J, UC)
BVP-7AP (EK)
B-BVP7A-PS173/M

C-45

C-46

A

B

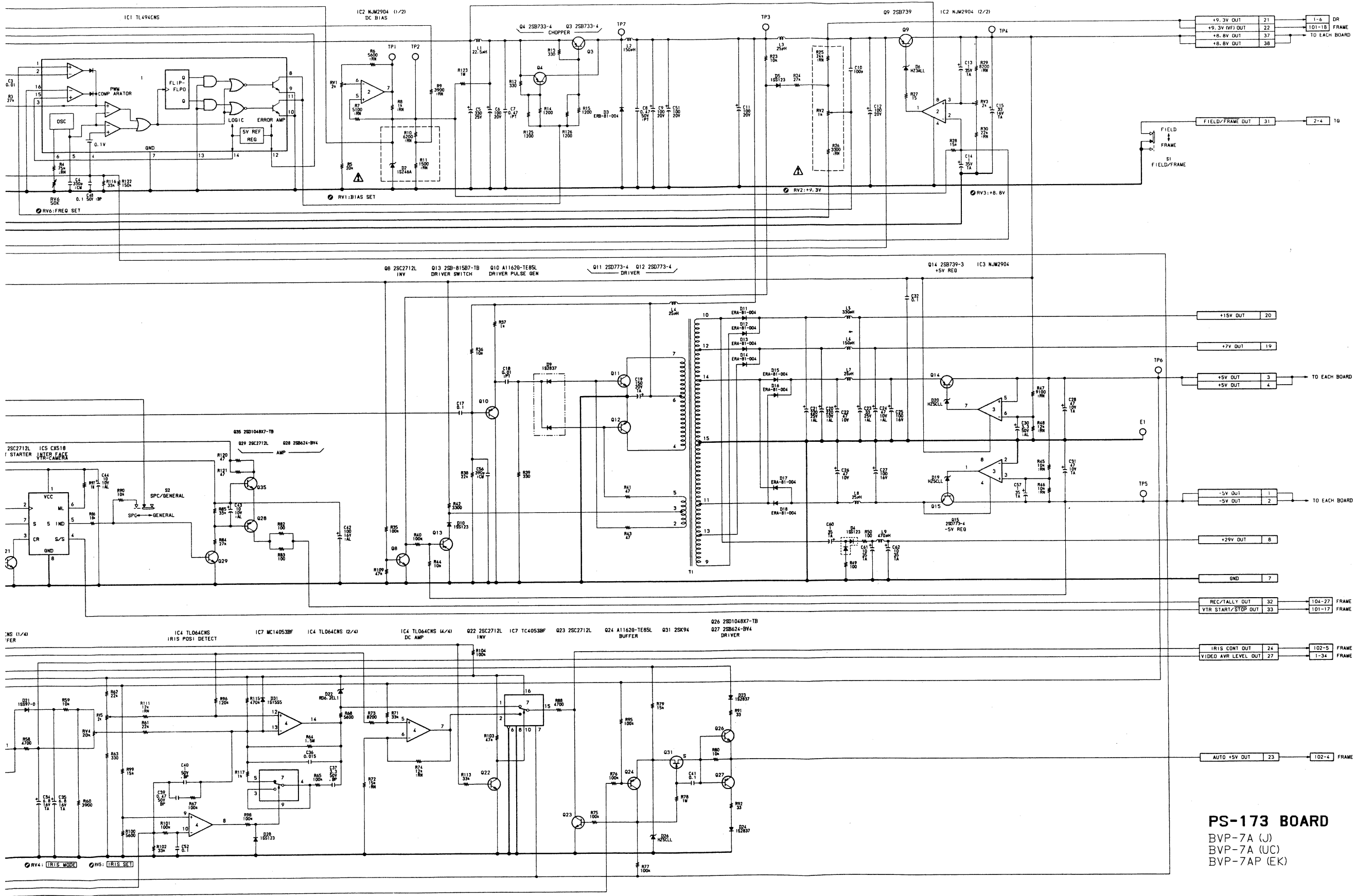
C

D

E

F

G



PS-173 BOARD
BVP-7A (J)
BVP-7A (UC)
BVP-7AP (EK)

C-46

C-47

D

E

F

G

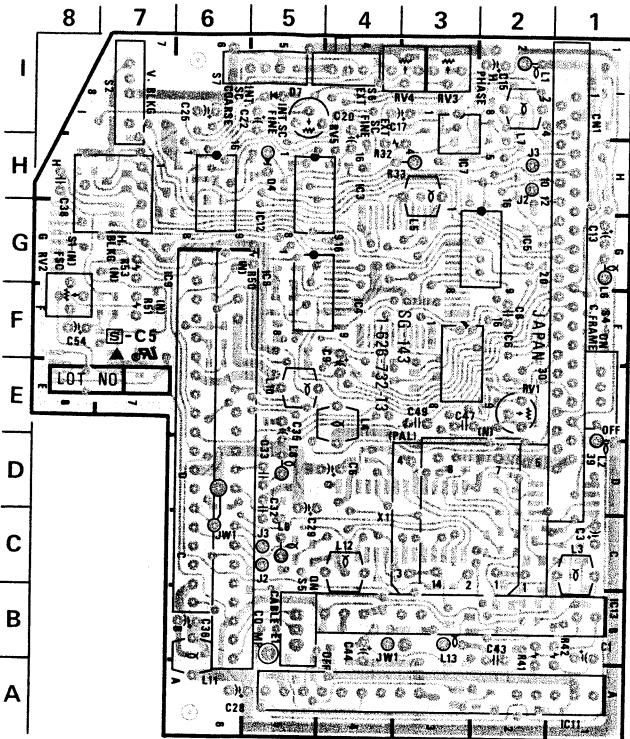
H

I

SG-143/143P BOARD

SG-143/143P (1-626-732-13)

CN1	I - 1	Q1	B - 2
		Q2	C - 2
D1	E - 3	Q3	C - 1
D2	G - 6	Q4	H - 1
D3	G - 2	Q5	H - 5
D4	H - 5	Q6	H - 3
D5	E - 2	Q7	A - 3
D6	A - 5	Q8	B - 3
D7	I - 5	Q9	B - 4
D8	G - 7		
D9	H - 7	RV1	E - 2
D10	F - 5 (P)	RV2	G - 8
		RV3	I - 3
		RV4	I - 3
		RV5	I - 4
IC1	C - 2	S1	G - 8
IC2	F - 3	S2	I - 7
IC3	H - 4	S4	F - 1
IC4	F - 4	S5	C - 5
IC5	G - 2	S6	I - 4
IC6	F - 2	S7	I - 6
IC7	H - 3		
IC8	G - 5		
IC9	G - 7		
IC10	G - 8		
IC11	A - 1	X1	C - 4
IC12	G - 5		
IC13	B - 1		
IC14	E - 8		
IC15	D - 1 (P)		



1-626-732-13 SOLDERING SIDE

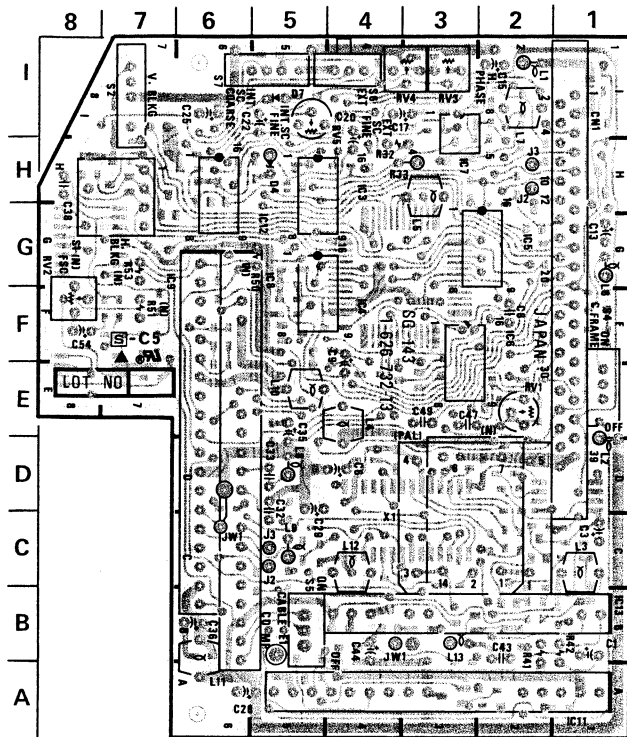
C-48

C-49

SG-143/143P BOARD

SG-143/143P (1-626-732-13)

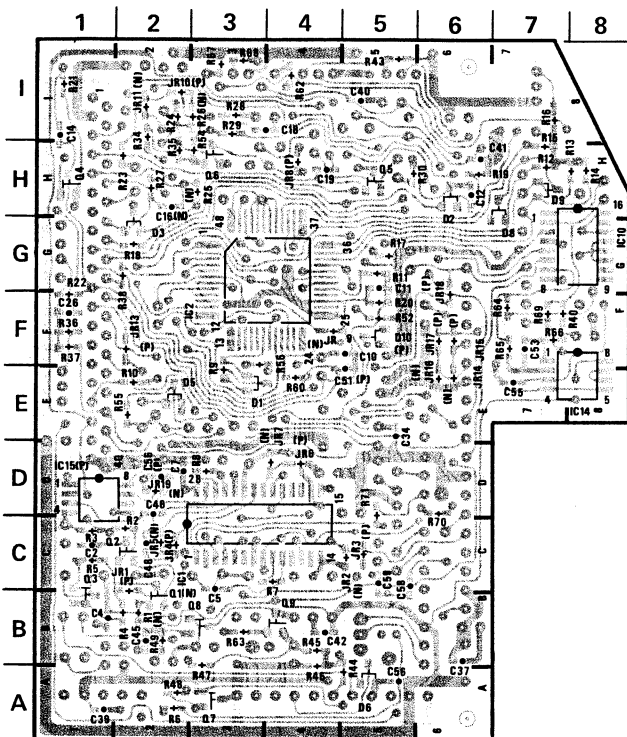
CN1	I - 1	Q1	B - 2
D1	E - 3	Q2	C - 2
D2	G - 6	Q3	C - 1
D3	G - 2	Q4	H - 1
D4	H - 5	Q5	H - 5
D5	E - 2	Q6	H - 3
D6	A - 5	Q7	A - 3
D7	I - 5	Q8	B - 3
D8	G - 7	Q9	B - 4
D9	H - 7	RV1	E - 2
D10	F - 5 (P)	RV2	G - 8
IC1	C - 2	RV3	I - 3
IC2	F - 3	RV4	I - 3
IC3	H - 4	RV5	I - 4
IC4	F - 4	S1	G - 8
IC5	G - 2	S2	I - 7
IC6	F - 2	S4	F - 1
IC7	H - 3	S5	C - 5
IC8	G - 5	S6	I - 4
IC9	G - 7	S7	I - 6
IC10	G - 8		
IC11	A - 1	X1	C - 4
IC12	G - 5		
IC13	B - 1		
IC14	E - 8		
IC15	D - 1 (P)		



1-626-732-13 SOLDERING SIDE

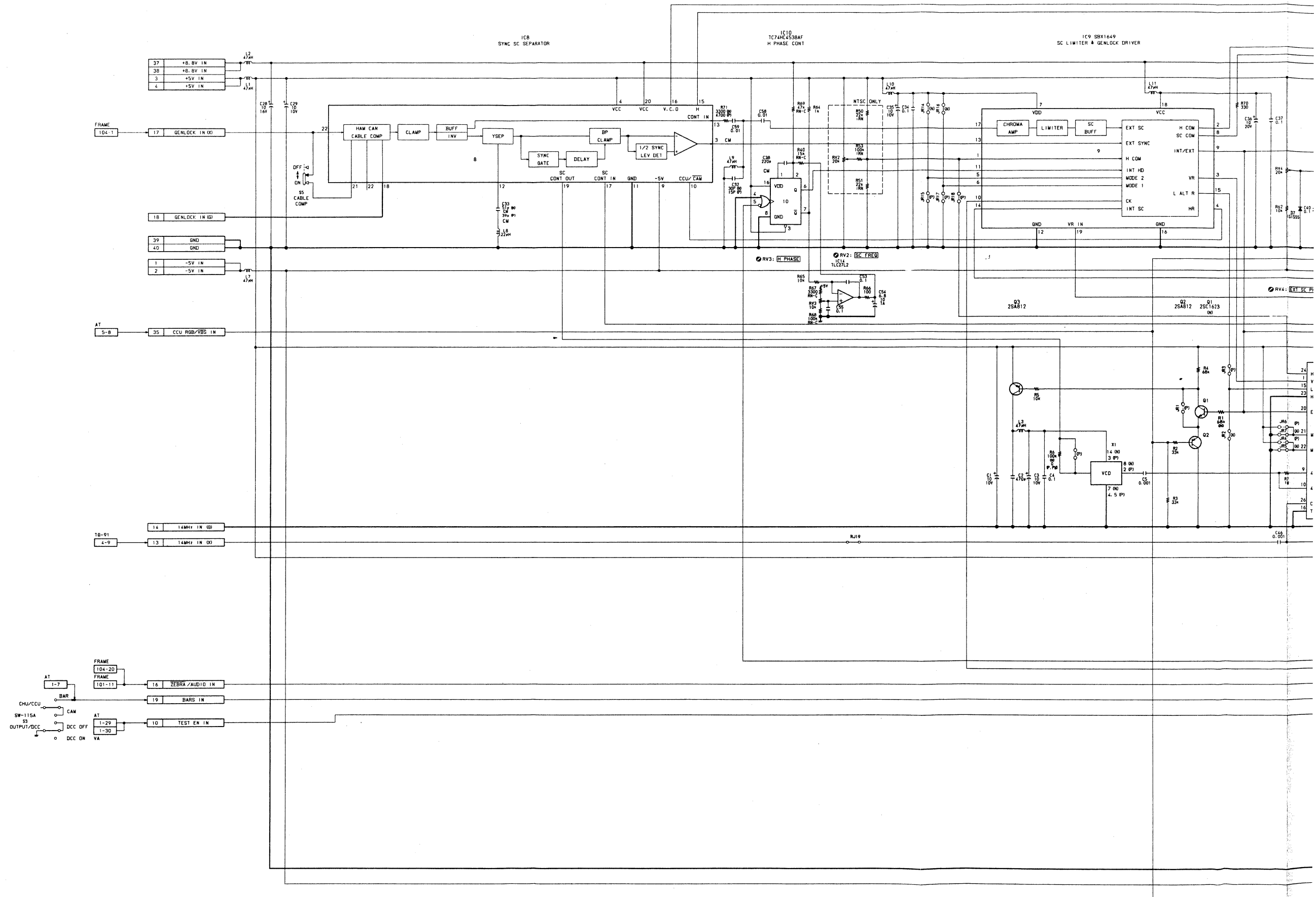
SG-143/143P (1-626-732-13)

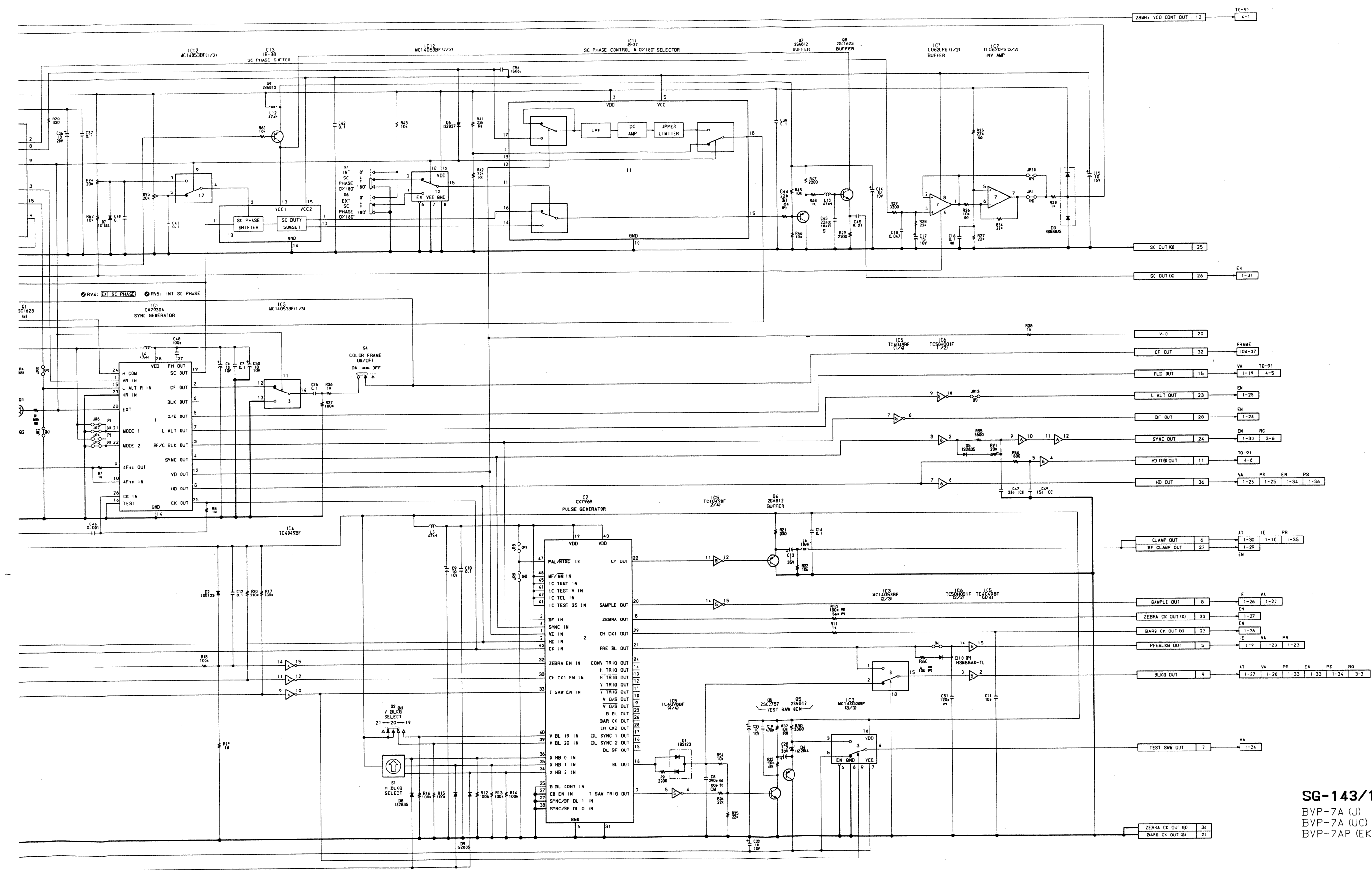
CN1	I - 1	Q1	B - 2
D1	E - 3	Q2	C - 2
D2	G - 6	Q3	C - 1
D3	G - 2	Q4	H - 1
D4	H - 5	Q5	H - 5
D5	E - 2	Q6	H - 3
D6	A - 5	Q7	A - 3
D7	I - 5	Q8	B - 3
D8	G - 7	Q9	B - 4
D9	H - 7	RV1	E - 2
D10	F - 5 (P)	RV2	G - 8
IC1	C - 2	RV3	I - 3
IC2	F - 3	RV4	I - 3
IC3	H - 4	RV5	I - 4
IC4	F - 4	S1	G - 8
IC5	G - 2	S2	I - 7
IC6	F - 2	S4	F - 1
IC7	H - 3	S5	C - 5
IC8	G - 5	S6	I - 4
IC9	G - 7	S7	I - 6
IC10	G - 8		
IC11	A - 1	X1	C - 4
IC12	G - 5		
IC13	B - 1		
IC14	E - 8		
IC15	D - 1 (P)		



1-626-732-13 SOLDERING SIDE

SG-143/143P BOARD
SYNC GENERATOR
TIMING PULSE GENERATOR
SC PHASE CONTROL





SG-143/143P BOARD

BVP-7A (J)
BVP-7A (UC)
BVP-7AP (EK)

C-53

C-54

G

H

I

J

K

L

M

AT-52A (1-623-334-14)

CN1 H - 5
CN2 D - 4
CN3 D - 8
CN4 C - 8
CN5 F - 3

D1 G - 8
D2 D - 6
D3 B - 7

IC1 H - 5
IC2 C - 8
IC3 G - 5
IC4 H - 8
IC5 E - 6
IC6 D - 6
IC7 C - 6
IC8 B - 4
IC9 E - 4
IC10 B - 6
IC11 D - 3
IC12 G - 5
IC13 B - 2
IC14 C - 6
IC15 G - 5

Q1 A - 4
Q2 A - 4
Q3 B - 3
Q4 A - 7
Q5 B - 8
Q6 D - 3

RP1 E - 7
RP2 C - 7

RV1 B - 1
RV2 A - 6

S1 C - 4
S2 A - 4

X1 F - 7

C-55

C-56

A

B

C

D

E

F

G

AT-52A BOARD

AT-52A (1-623-334-14)

CN1 H-5
CN2 D-4
CN3 D-8
CN4 C-8
CN5 F-3

D1 G-8
D2 D-6
D3 B-7

IC1 H-5
IC2 C-8
IC3 G-5
IC4 H-8
IC5 E-6
IC6 D-6
IC7 C-6
IC8 B-4
IC9 E-4
IC10 B-6
IC11 D-3
IC12 G-5
IC13 B-2
IC14 C-6
IC15 G-5

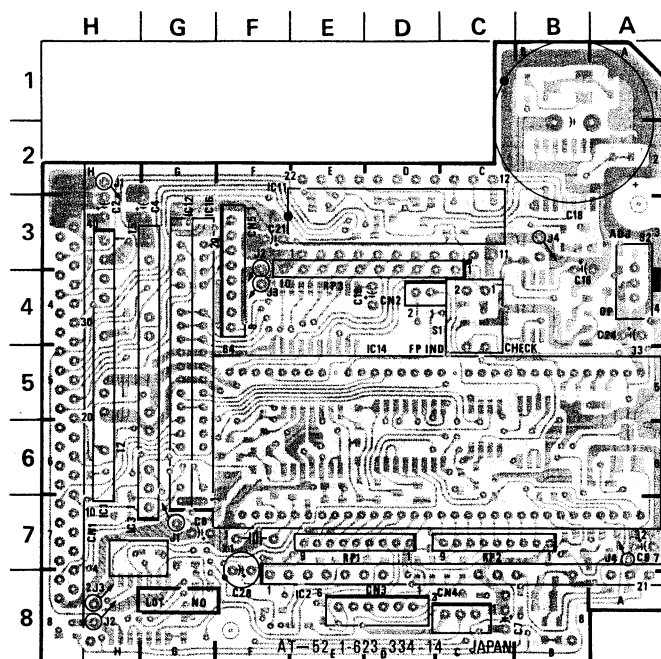
Q1 A-4
Q2 A-4
Q3 B-3
Q4 A-7
Q5 B-8
Q6 D-3

RP1 E-7
RP2 C-7

RV1 B-1
RV2 A-6

S1 C-4
S2 A-4

X1 F-7

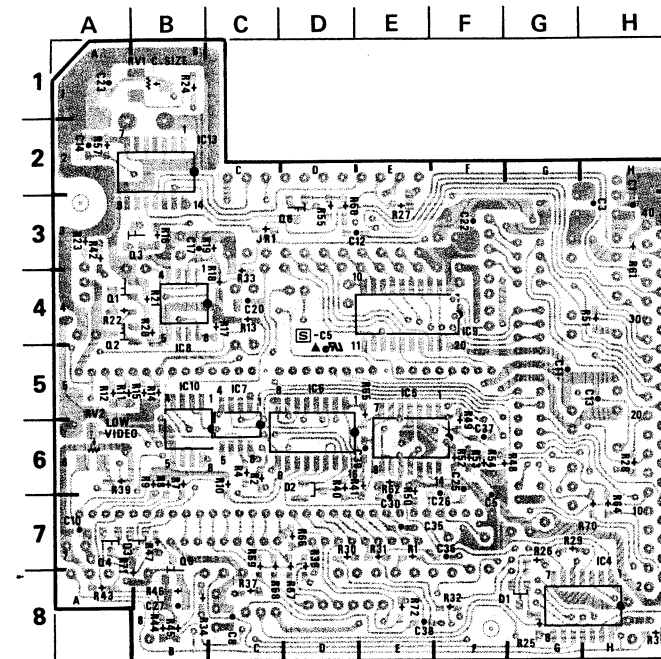


1-623-334-14 SOLDERING SIDE

C-57

AT-52A

AT-52A



1-623-334-14 SOLDERING SIDE

C-58

AT-52A (1-623-334-14)

CN1 H-5
CN2 D-4
CN3 D-8
CN4 C-8
CN5 F-3

D1 G-8
D2 D-6
D3 B-7

IC1 H-5
IC2 C-8
IC3 G-5
IC4 H-8
IC5 E-6
IC6 D-6
IC7 C-6
IC8 B-4
IC9 E-4
IC10 B-6
IC11 D-3
IC12 G-5
IC13 B-2
IC14 C-6
IC15 G-5

Q1 A-4
Q2 A-4
Q3 B-3
Q4 A-7
Q5 B-8
Q6 D-3

RP1 E-7
RP2 C-7

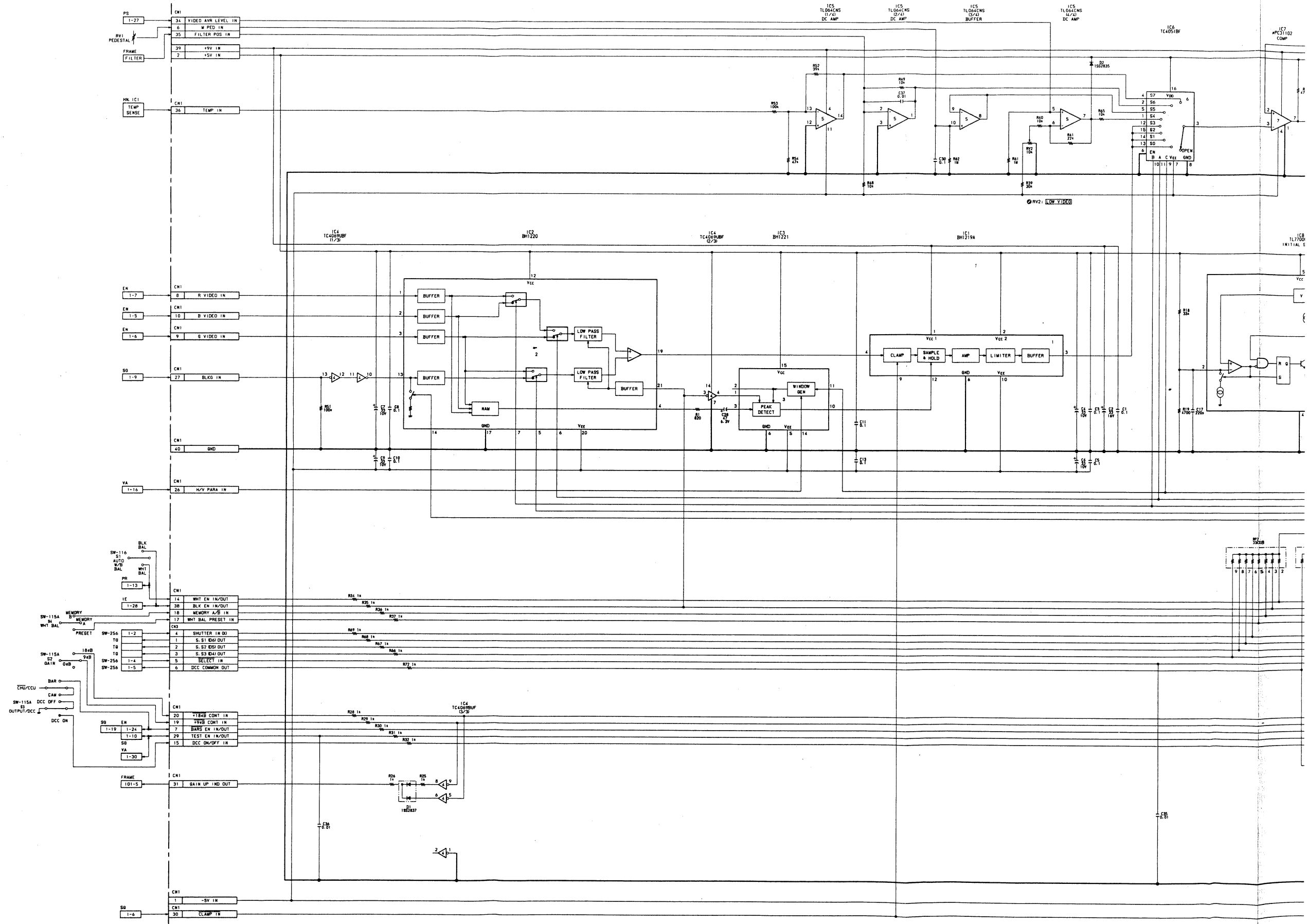
RV1 B-1
RV2 A-6

S1 C-4
S2 A-4

X1 F-7

BVP-7A (J, UC)
BVP-7AP (EK)

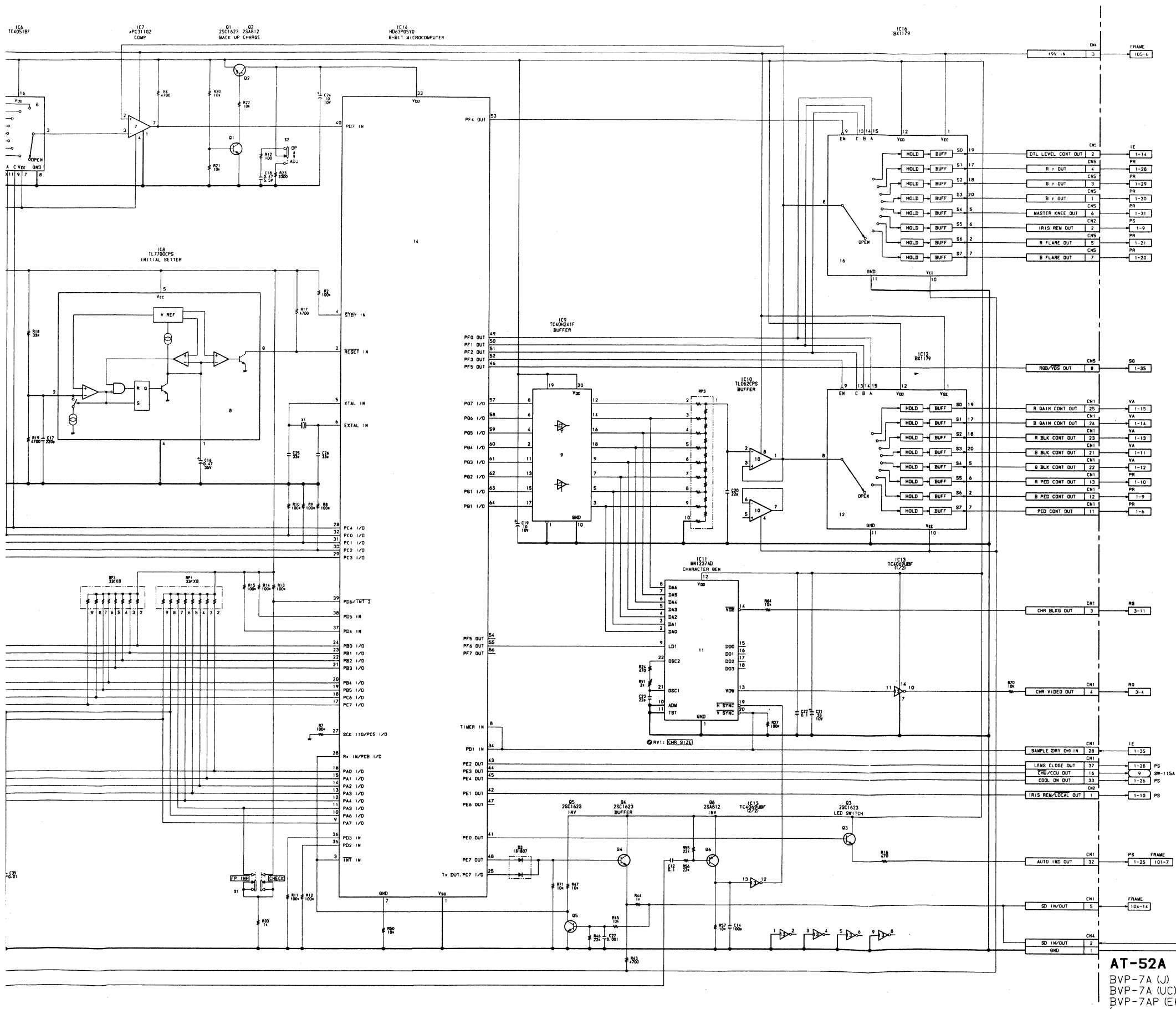
AT-52A BOARD
 AUTO WHITE BALANCE
 AUTO BLACK BALANCE
 AUTO CENTERING
 AUTO IRIS
 CHARACTER GENERATOR



BVP-7A (J, UC)
 BVP-7AP (EK)
 B-BVP7A-AT52A/M

C-59

C-60



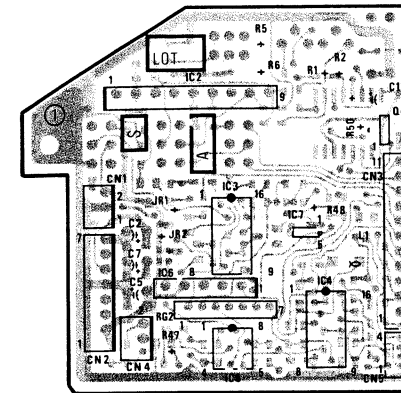


C-63

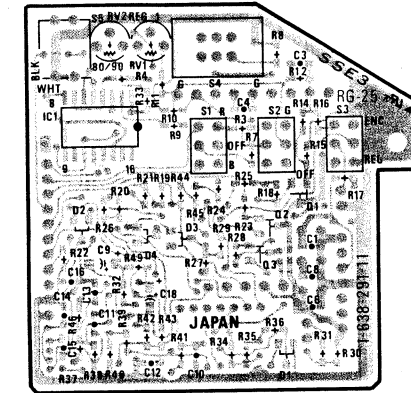
C-64

A | B | C | D | E | F | G |

RG-25/25AP BOARD

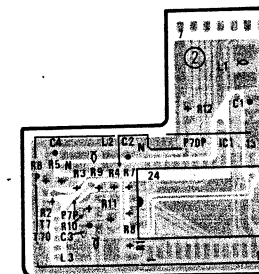


1-638-291-11 SOLDERING SIDE

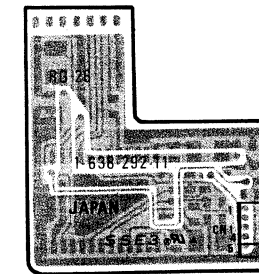


1-638-291-11 SOLDERING SIDE

RG-26/26AP BOARD



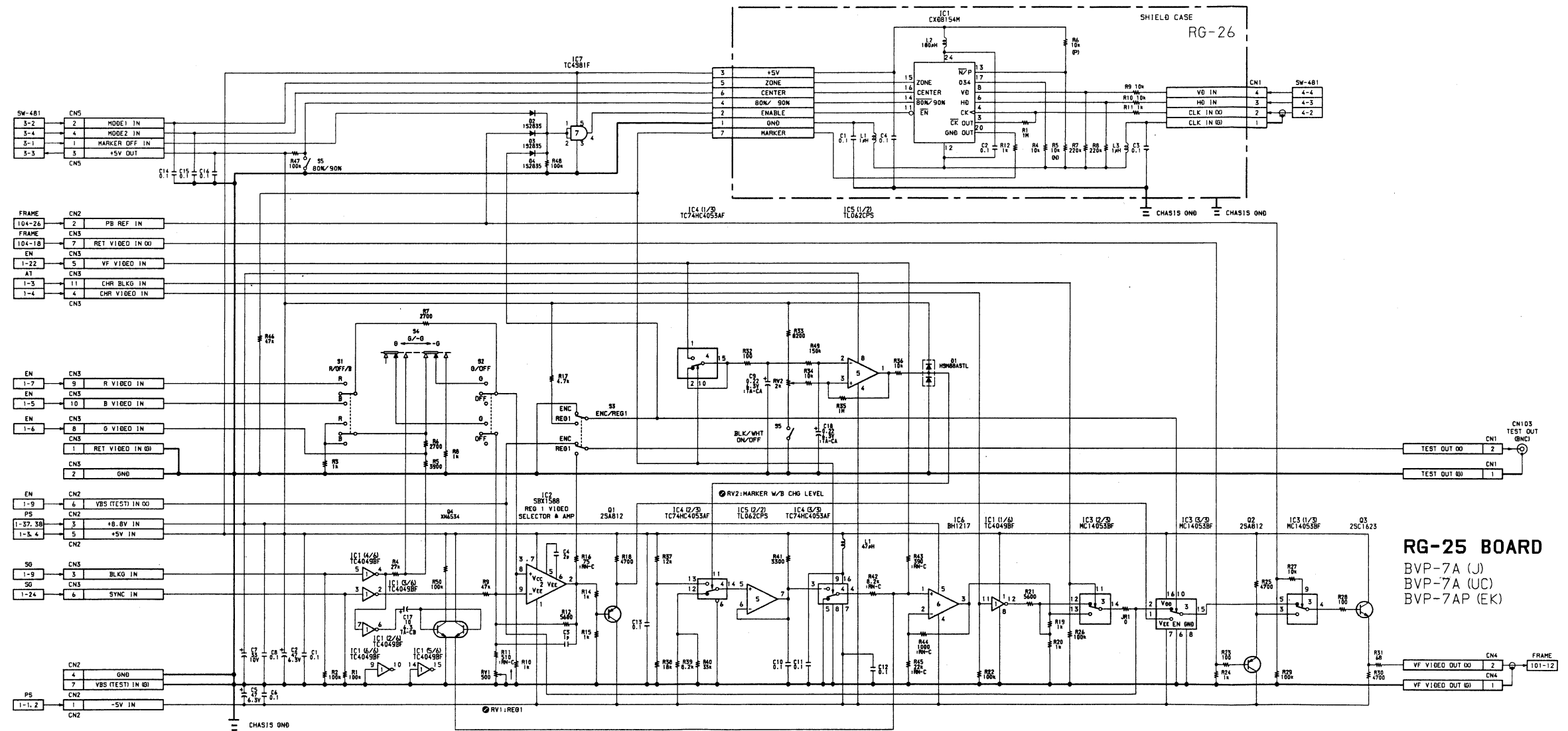
1-638-292-11 SOLDERING SIDE



1-638-292-11 SOLDERING SIDE

RG-25/25AP RG-26/26AP

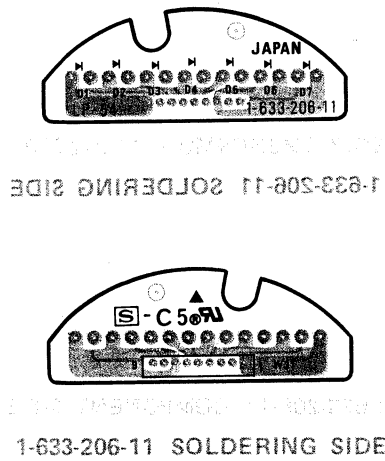
RG-25/25AP RG-26/26AP

RG-25/25AP BOARD
RG-26/26AP BOARDBVP-7A (J, UC)
BVP-7AP (EK)
B-BVP7A-RG25/M.1

C-67

C-68

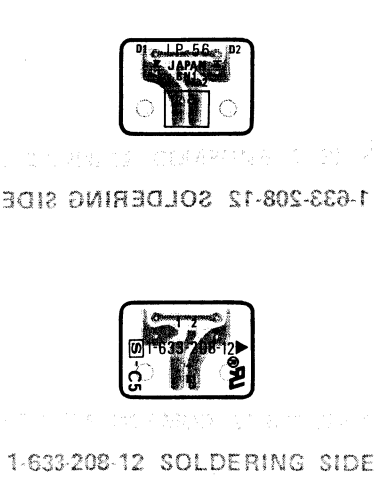
LP-54 BOARD



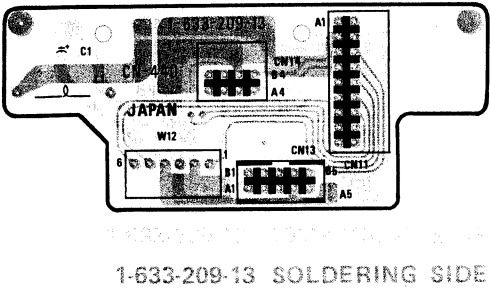
LP-55 BOARD



LP-56 BOARD



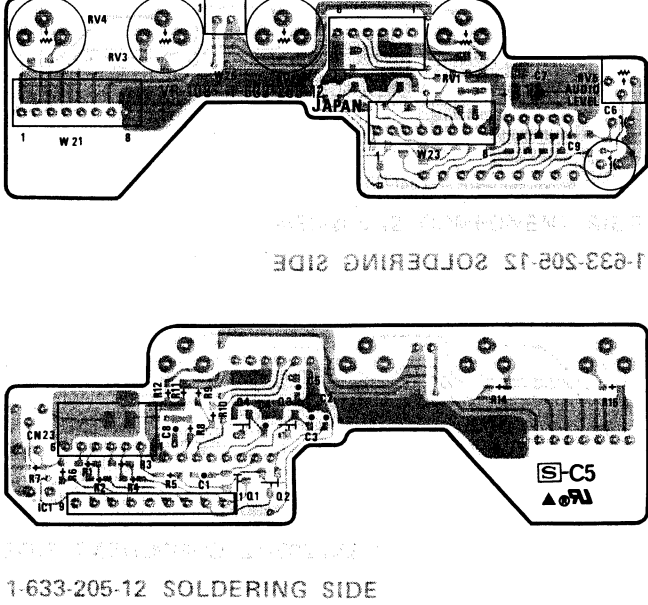
CN-440 BOARD



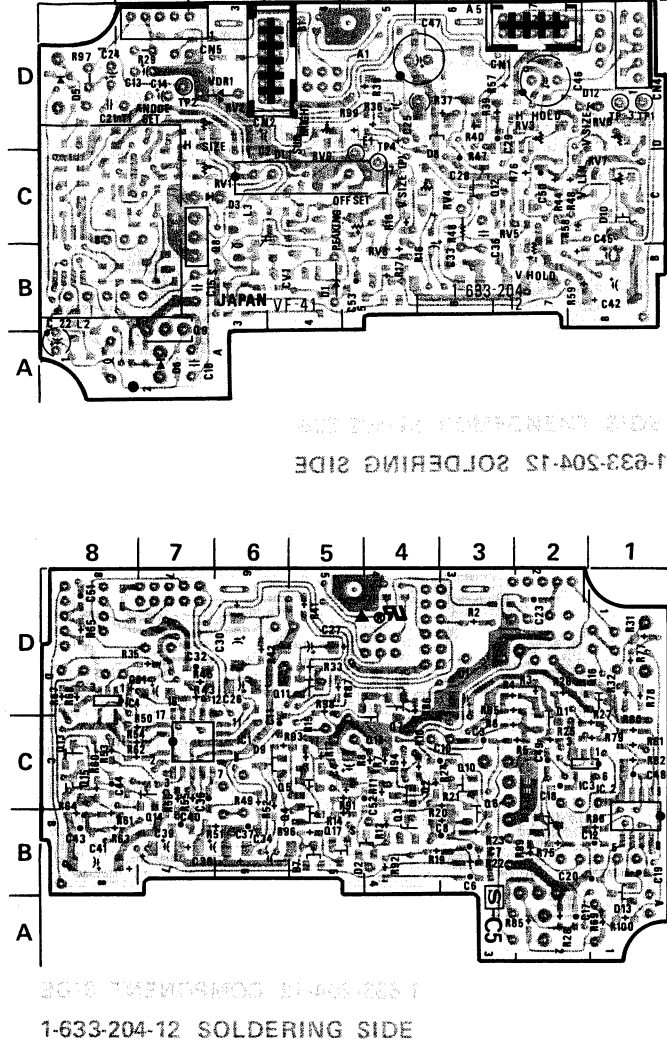
SW-425 BOARD



VR-108 BOARD



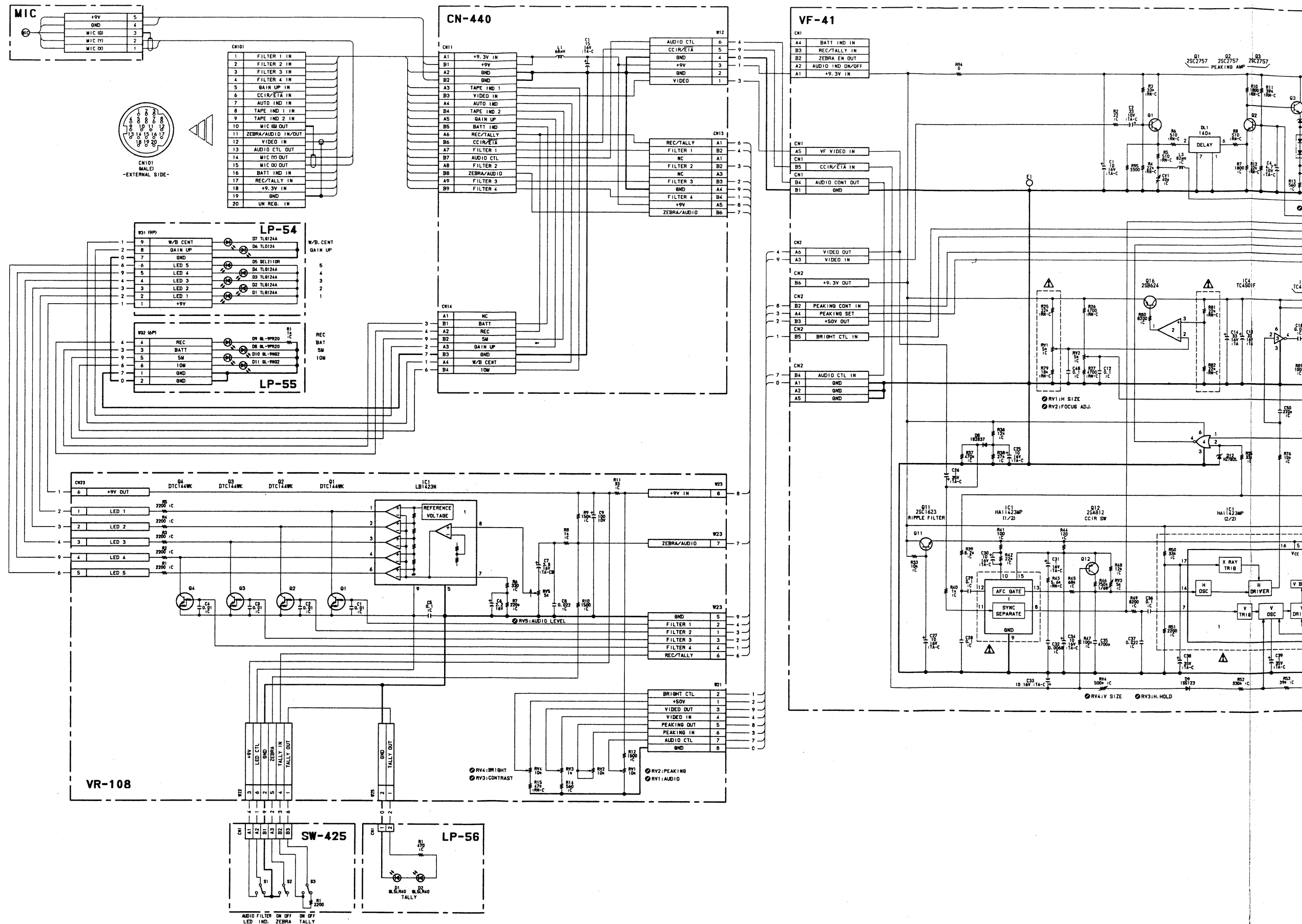
VF-41 BOARD



VF-41 (1-633-204-12)			
CN1	D - 7	RV1	C - 3
CN2	D - 4	RV2	D - 3
CN4	D - 8	RV3	D - 7
CN5	D - 3	RV4	C - 6
CV1	B - 4	RV5	C - 7
D1	B - 4	RV6	D - 8
D2	B - 5	RV7	C - 8
D3	C - 3	RV8	B - 5
D5	D - 1	RV9	C - 4
D6	A - 2	TP1	D - 8
D7	B - 5	TP2	D - 2
D8	C - 6	TP3	D - 8
D9	C - 6	TP4	D - 5
D10	C - 8	T1	D - 2
D11	B - 2	VDR1	D - 3
D12	D - 8		
D13	A - 1		
DL1	C - 4		
E1	D - 5		
IC1	C - 6		
IC2	C - 1		
IC3	C - 2		
IC4	D - 8		
Q1	D - 2		
Q2	C - 4		
Q3	B - 4		
Q4	B - 6		
Q5	C - 6		
Q6	C - 3		
Q7	C - 4		
Q8	B - 3		
Q9	A - 3		
Q10	C - 3		
Q11	D - 6		
Q12	C - 7		
Q13	C - 8		
Q14	B - 7		
Q15	C - 8		
Q16	D - 1		
Q17	B - 5		
Q18	C - 4		

VIEWFINDER FRAME WIRING

CN-440 BOARD
LP-54 BOARD
LP-55 BOARD
LP-56 BOARD
SW-425 BOARD
VF-41 BOARD
VR-108 BOARD



BVP-7A (J, UC)
BVP-7AP (EK)
B-BVP7A-VIEWFINDER/M

C-71

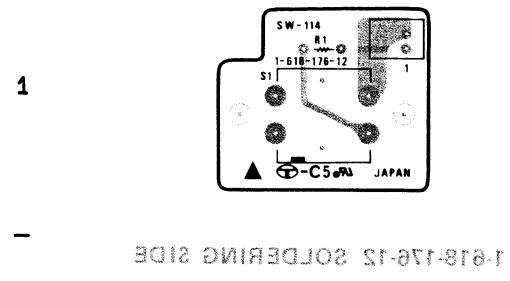
C-72



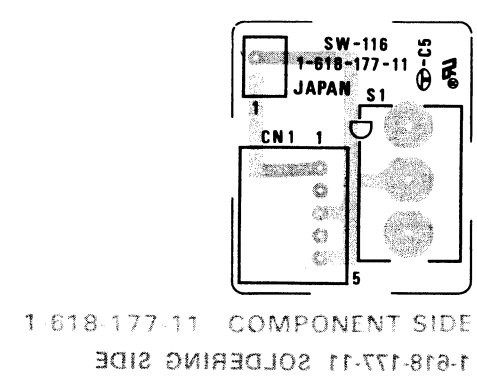
BVP-7A (J)
BVP-7A (UC)
BVP-7AP (EK)

NOTE	
CHANGE	INFORMATION
C29	24
CHOISE	27
	30
	33
	36

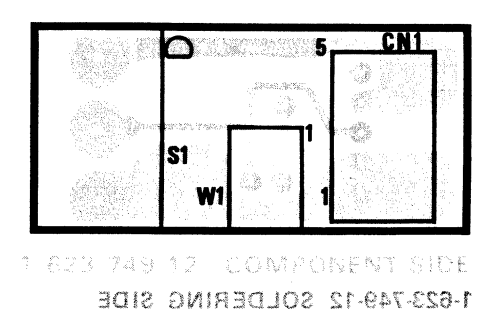
SW-114 BOARD



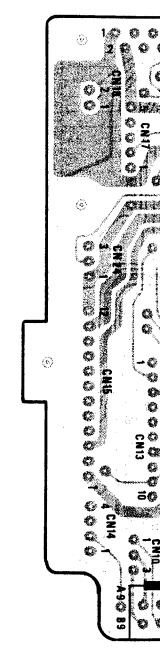
SW-116 BOARD



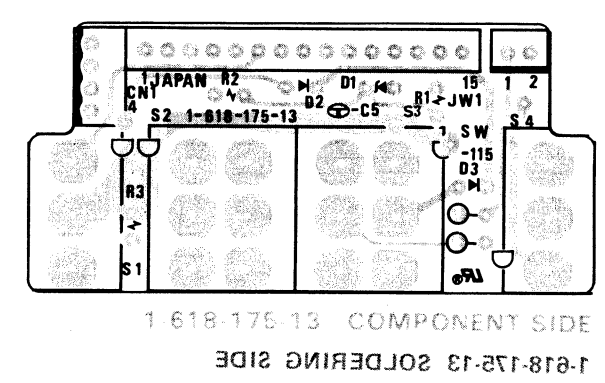
SW-256 BOARD



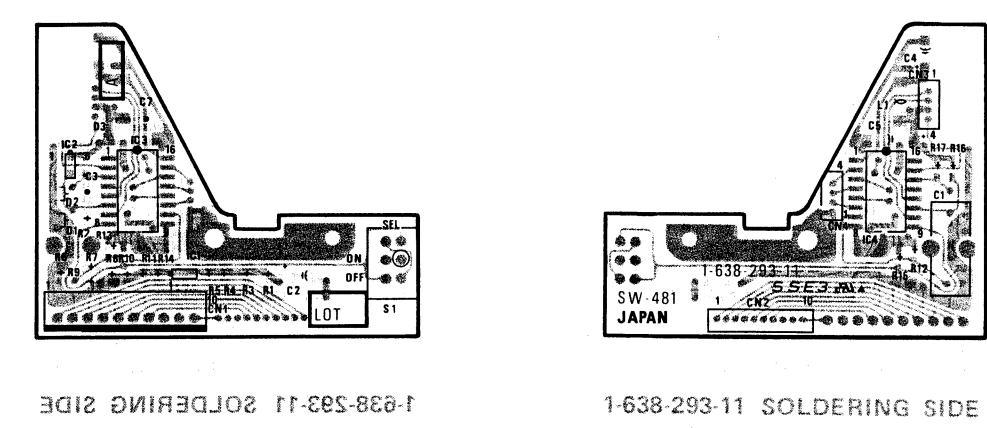
HN-135A BOARD



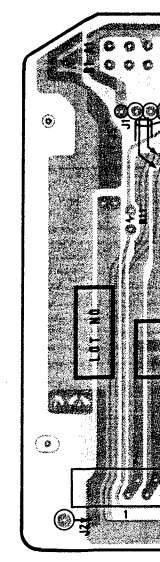
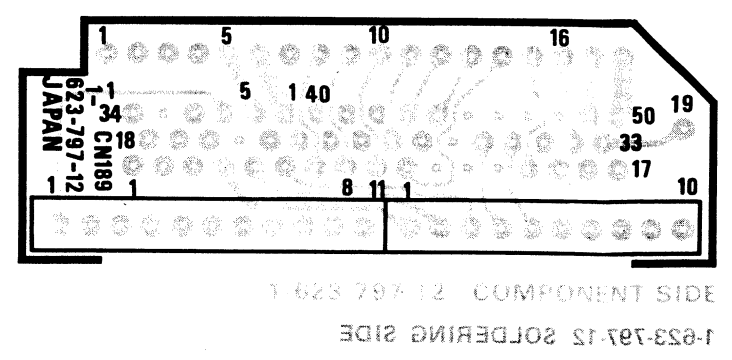
SW-115A BOARD



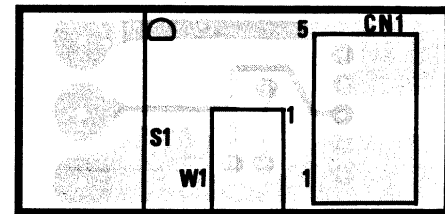
SW-481A BOARD



CN-189 BOARD

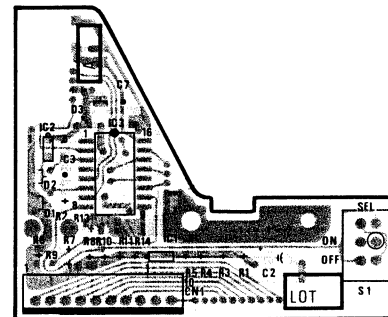


SW-256 BOARD

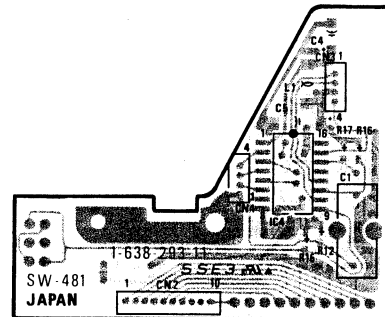


1-623-749-12 COMPONENT SIDE
1-623-749-15 SOLDERING SIDE

SW-481A BOARD

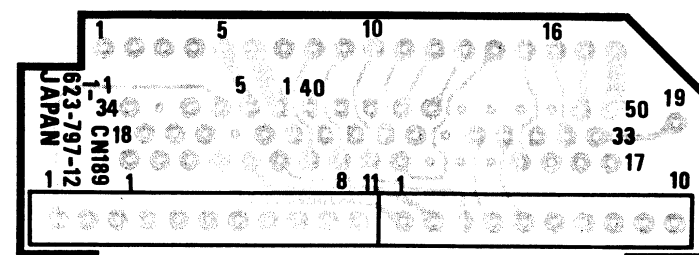


1-638-583-11 SOLDERING SIDE



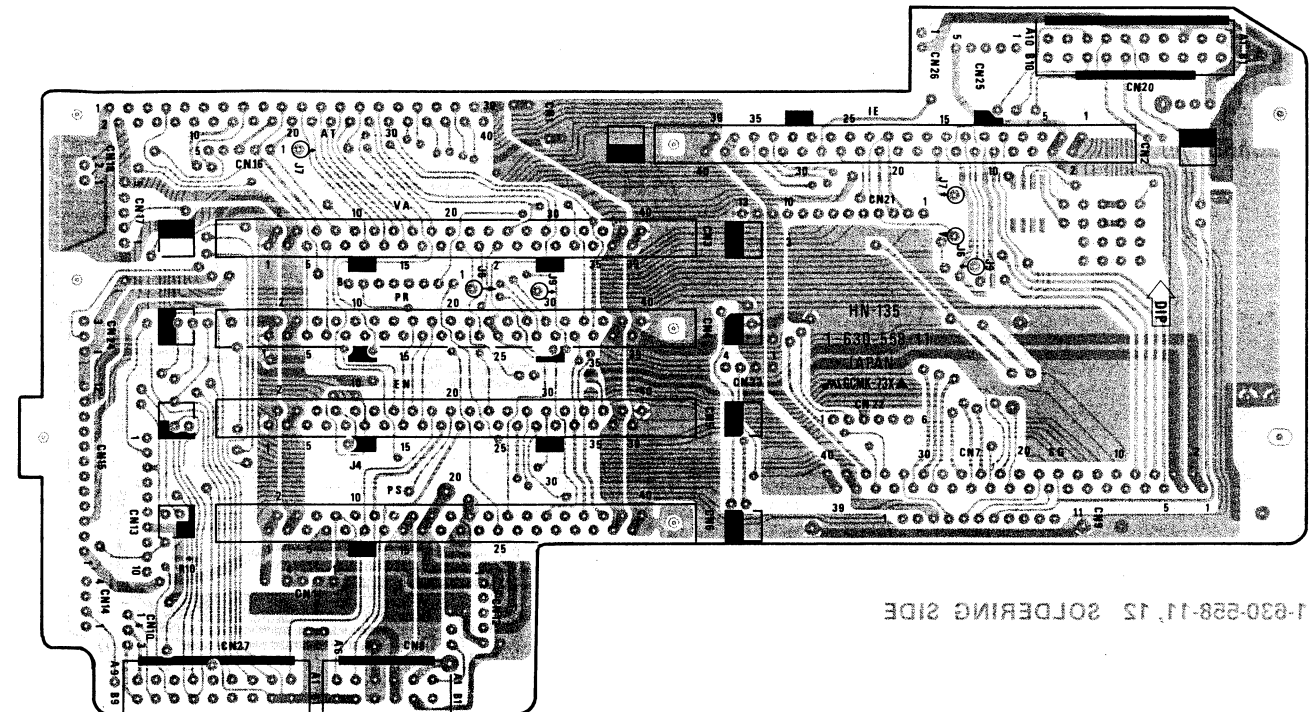
1-638-293-11 SOLDERING SIDE

CN-189 BOARD

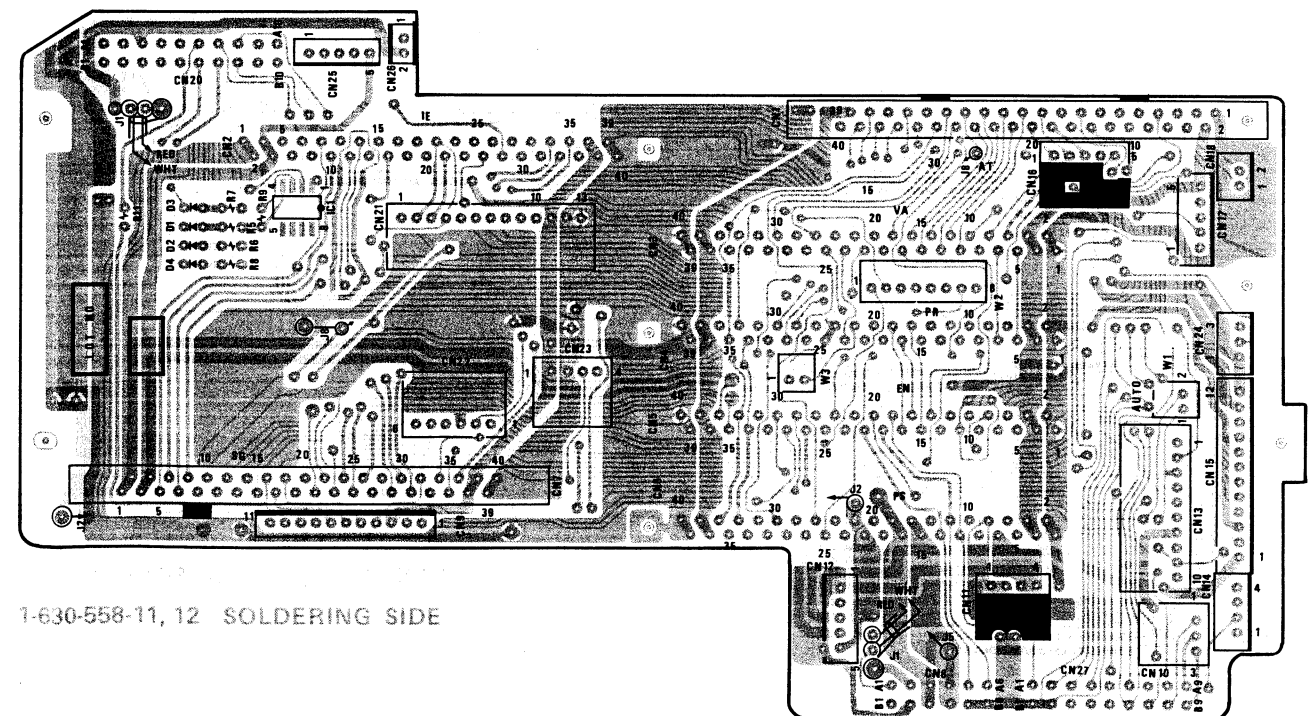


1-623-797-12 COMPONENT SIDE
1-623-797-15 SOLDERING SIDE

HN-135A BOARD



1-630-558-11, 15 SOLDERING SIDE

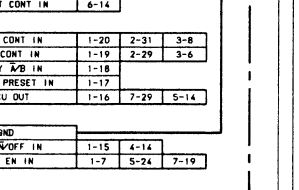
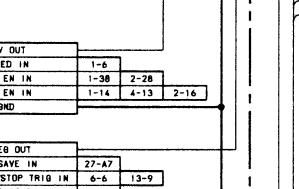
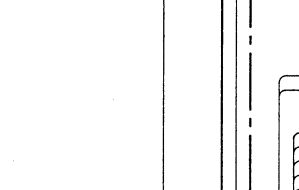
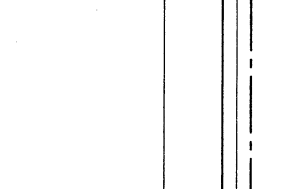
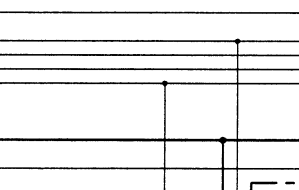
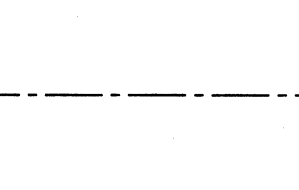
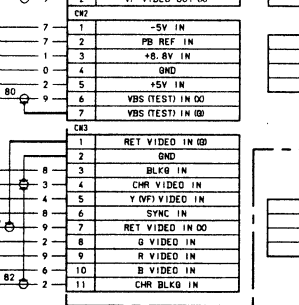
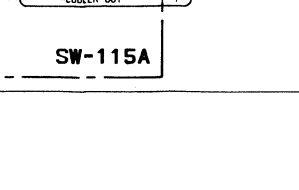
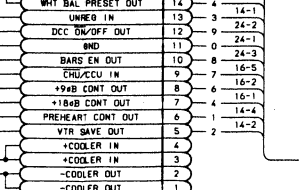
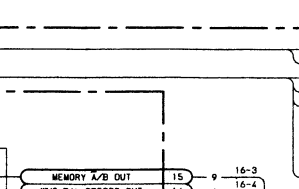
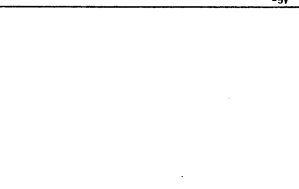
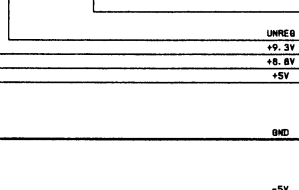
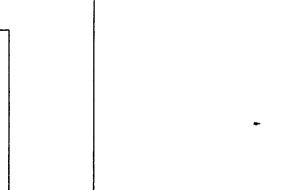
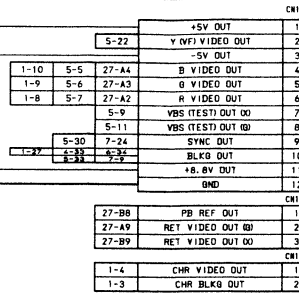
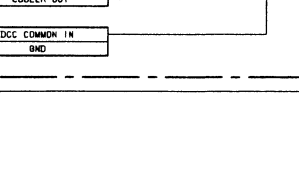
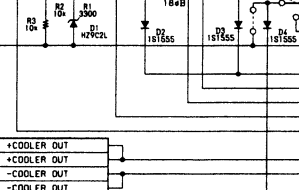
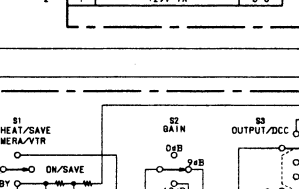
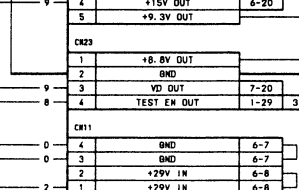
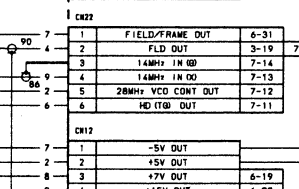
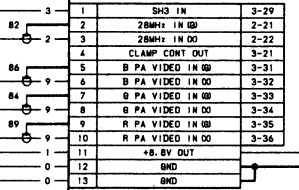
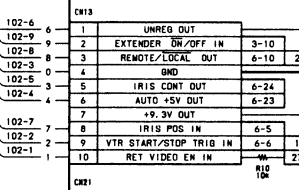
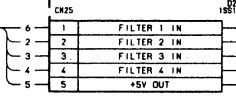
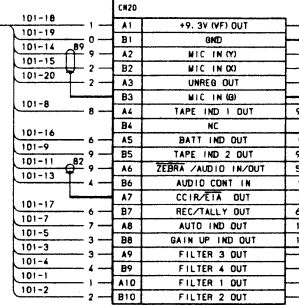
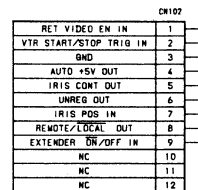
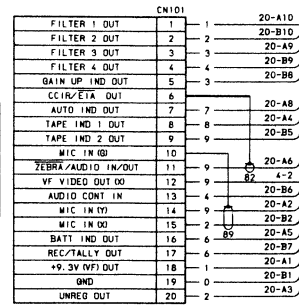
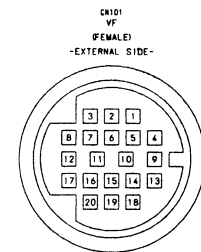


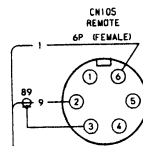
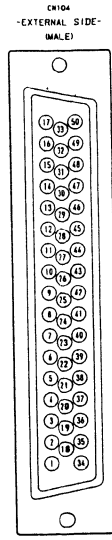
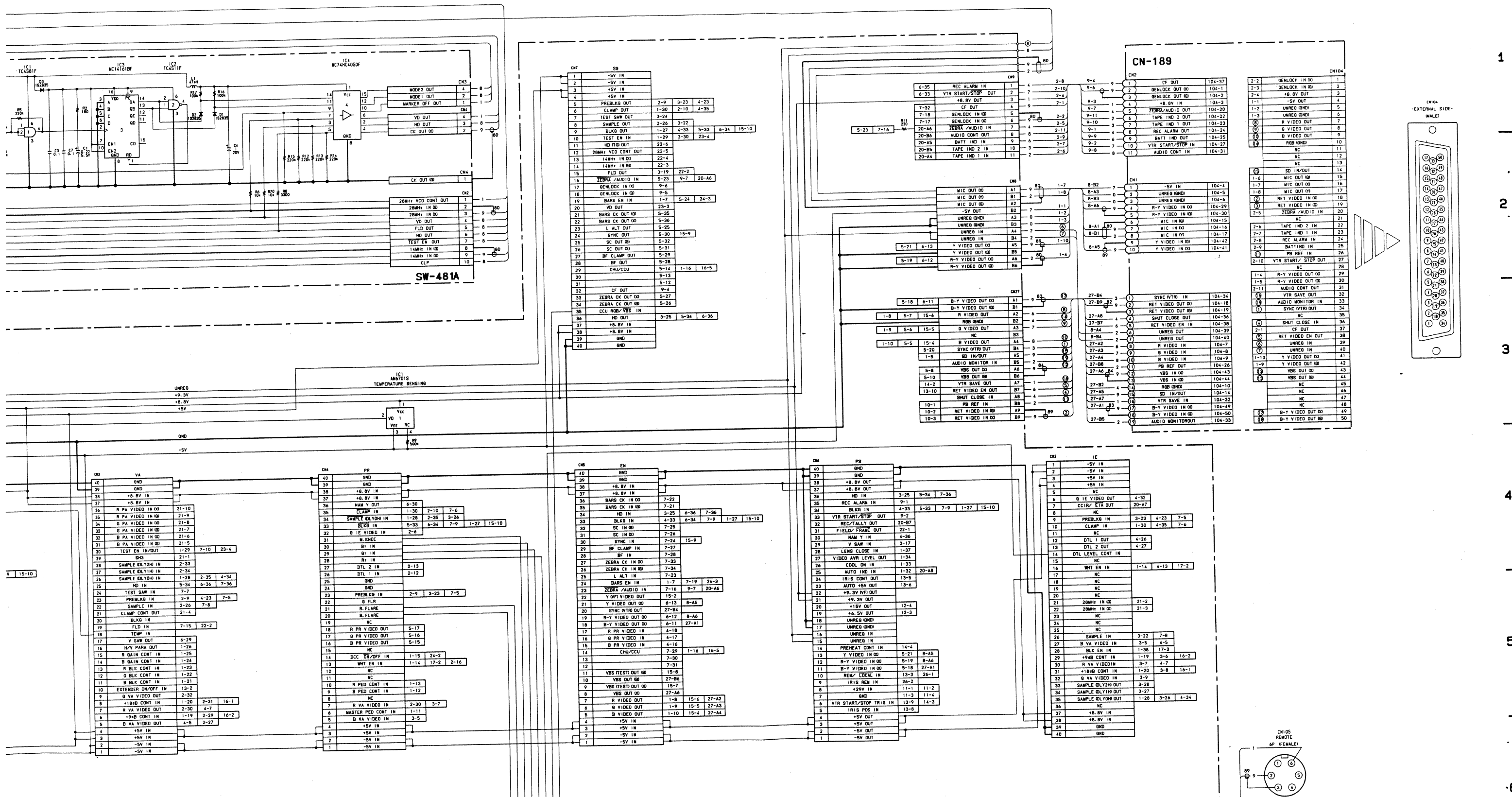
1-630-558-11, 12 SOLDERING SIDE

FRAME WIRING

HN-135A BOARD
SW-114 BOARD
SW-115A BOARD
SW-116 BOARD
SW-256 BOARD
SW-481A BOARD

HN-135A SW-114 SW-115A
SW-116 SW-256 SW-481A FRAME FRAME HN-135A SW-114 SW-115A
SW-116 SW-256 SW-481A





FRAME WIRING
BVP-7A (J)
BVP-7A (UC)
BVP-7AP (EK)

HN-135A

C-80

G

H

C-79

I

J

K

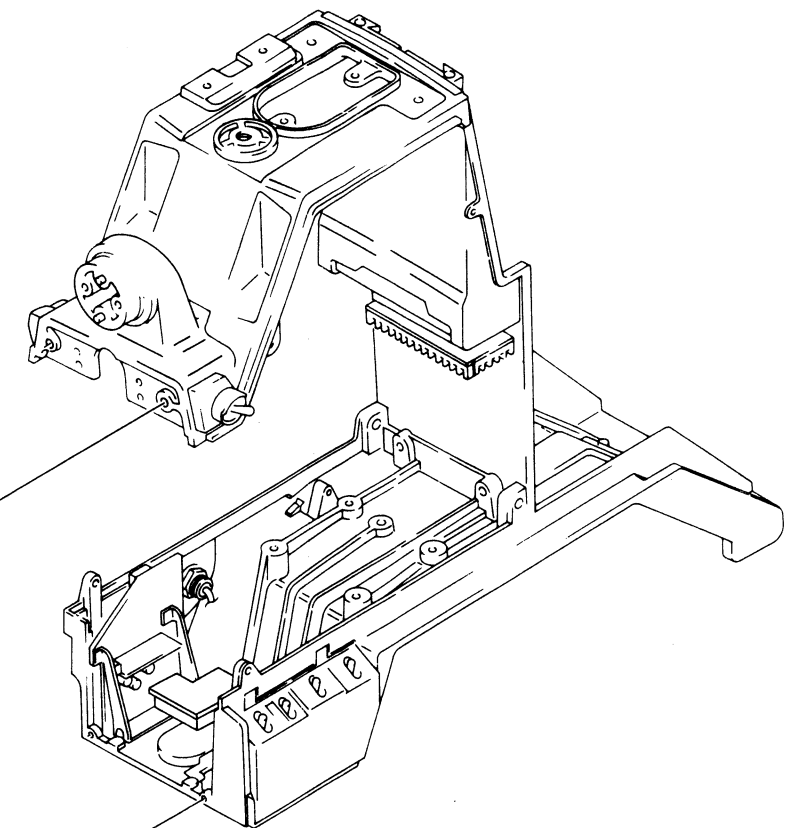
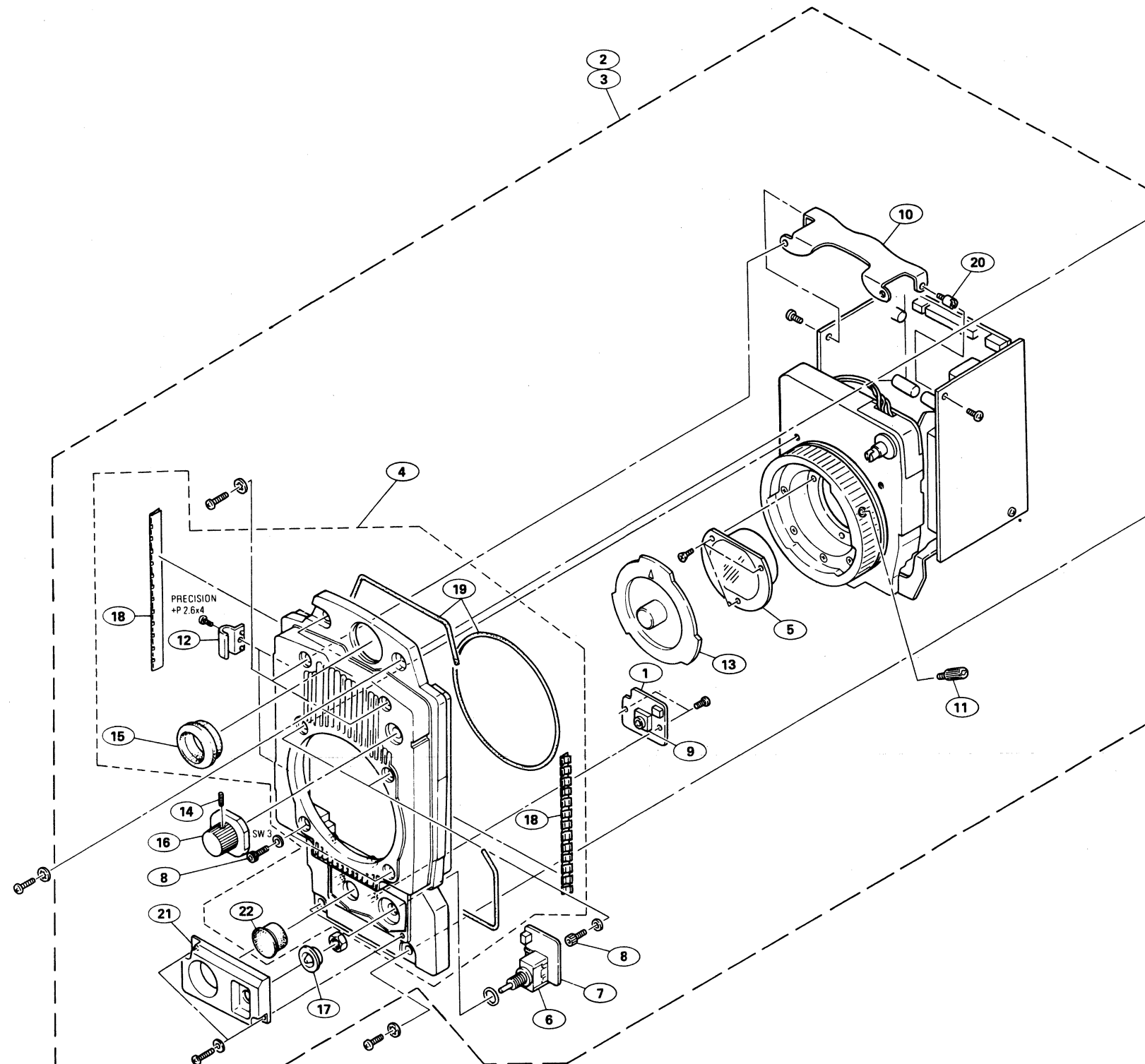
L

M

FRONT ASSY

FRONT ASSY

FRONT ASSY



BVP-7A(J,UC)
BVP-7A(EK)

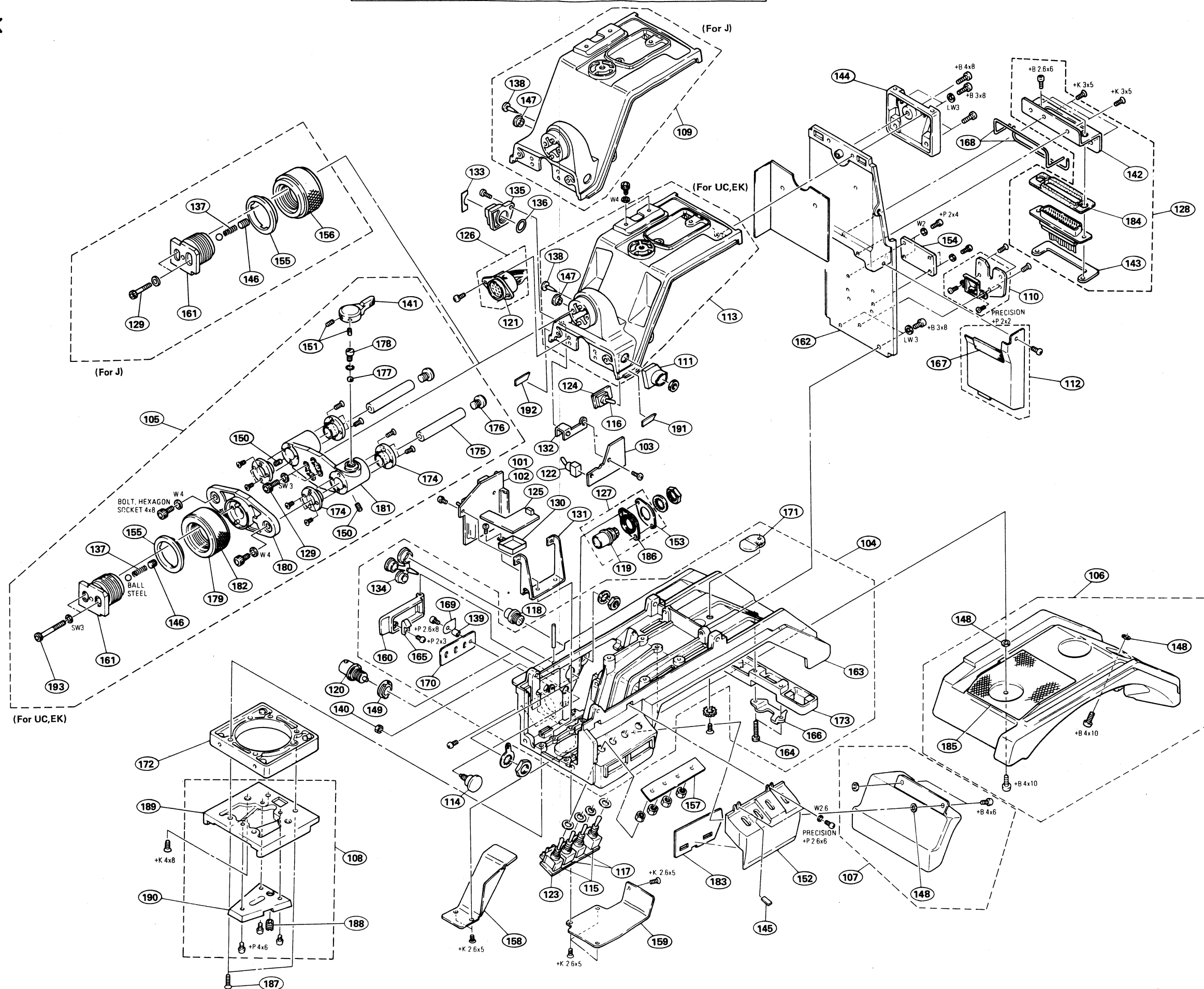
D-3

D-4

CHASSIS BLOCK

CHASSIS BLOCK

CHASSIS BLOCK



CHASSIS ASSY

No.	Part No.	SP Description		
101	A-7515-304-A	o MOUNTED CIRCUIT BOARD, RG-25AP (EK)	156	3-710-019-01 o RING, ROCK (J)
102	A-7515-307-A	o MOUNTED CIRCUIT BOARD, RG-25 (J,UC)	157	3-710-027-01 o SHEET, BLIND
103	A-7520-542-A	o MOUNTED CIRCUIT BOARD, SW-481A	158	3-710-029-02 o LID (B), B
104	A-7550-115-A	o CHASSIS BLOCK ASSY, BASE	159	3-710-030-01 o LID (A), B
105	A-7612-311-C	o SLIDE ASSY, VF (UC,EK)	160	3-710-031-01 o COVER, SWITCH
106	A-7612-312-C	s PAD ASSY (2), SHOULDER	161	3-710-039-03 s SHOE, SLIDE
107	A-7612-321-A	s PAD (2) (SMALL), SHOULDER	162	3-710-047-04 o PLATE, REAR
108	A-7612-385-A	s SHOE (B) ASSY, V	163	3-710-049-05 s CHASSIS, BASE
109	X-3710-002-6	s PLATE ASSY, UPPER (J)	164	3-710-050-11 s BOLT (M2.6X15), HEXAGON HOLE
110	X-3710-026-1	o STOPPER ASSY	165	3-710-093-01 o SPACER, SWITCH
111	X-3710-029-2	s GUARD ASSY, SHUTTER	166	3-711-703-01 o STOPPER
112	X-3710-038-1	o CASE ASSY, SHIELD	167	3-711-704-01 o COVER, RUBBER
113	X-3710-042-3	o PLATE (2) ASSY, UPPER (UC,EK)	168	3-711-715-01 o RUBBER, SHIELD
114	1-223-165-00	s RES, ADJ. WIREWOUND 10K "PEDESTAL"	169	3-711-727-01 o SPRING, LEAF
115	1-554-356-00	s SWITCH, TOGGLE "CAMERA/VTR" "WHT BAL"	170	3-711-754-03 o PLATE (2), INDICATION, RG
116	1-554-396-00	s SWITCH, TOGGLE "SHUTTER"	171	3-711-760-01 o SPRING
117	1-554-400-00	s SWITCH, TOGGLE "GAIN" "OUTPUT/DCC"	172	3-711-788-01 o SPACER, P5
118	1-561-233-21	s CONNECTOR, 6P "REMOTE"	173	3-711-789-01 o SPACER, REAR
119	1-562-221-21	s CONNECTOR, 12P "LENS"	174	3-711-790-01 o SPACER (A)
120	1-562-261-21	o CONNECTOR, COAXIAL (BNC) "TEST OUT"	175	3-711-791-01 o ARM
121	1-565-051-11	o CONNECTOR, ROUND (WITH C) 20P "VF"	176	3-711-792-01 o SCREW
122	1-570-986-01	s SWITCH, TOGGLE "MARKER"	177	3-711-793-01 o CUSHION (STOPPER)
123	1-618-175-13	o PRINTED CIRCUIT BOARD, SW-115A	178	3-711-794-01 o PIN, STOPPER
124	1-623-749-12	o PRINTED CIRCUIT BOARD, SW-256	179	3-711-795-01 o RING (B), LOCK
125	1-638-292-11	o PRINTED CIRCUIT BOARD, RG-26	180	3-711-796-03 o TABEL, FIXED, VF SHOE
126	1-937-212-31	o HARNESS (VF)	181	3-711-797-07 o TABEL, FIXED, VF SLIDE
127	1-937-218-11	o HARNESS (LENS)	182	3-720-919-01 o RUBBER, LOCK RING
128	1-939-723-15	o HARNESS (50P PC BOARD TYPE)	183	3-720-960-01 o PACKING, SWITCH
129	2-990-375-11	s BOLT M3X10, HEXAGON SOCKET	184	3-720-961-01 o PACKING, 50P
130	3-168-886-01	o CASE, SHIELD	185	3-720-964-01 o NET (2)
131	3-168-887-01	o PLATE (2), FIXED, RG	186	3-725-297-01 o SPACER (LENS)
132	3-168-888-01	o BRACKET, PC BOARD	187	3-729-072-11 s SCREW, +K (4X20)
133	3-168-889-01	o PLATE, INDICATION, VF MARKER	188	3-742-011-01 s SCREW, 1/4, 3/8 CONVERSION
134	3-168-893-01	o PACKING (BNC), DROP PROTECTION	189	3-742-012-01 s SHOE (B), CAMERA
135	3-169-662-01	o GUARD, VF MARKER	190	3-742-015-01 o WEDGE (B), MOUNTING
136	3-312-823-00	s PACKING, KNOB	191	3-742-218-01 o PACKING, RIGHT PANEL
137	3-641-622-00	s SPRING, COMPRESSION	192	3-742-219-01 o PACKING, LEFT PANEL
138	3-644-002-00	o CUSHION, HANDLE	193	4-904-818-01 s BOLT (3X25), HEXAGON HOLE
139	3-659-365-00	s SPACER (4X3)		
140	3-664-519-00	o NUT (M4)		
141	3-673-046-00	s LEVER, LOCK		
142	3-675-902-21	o BRACKET (A), CONNECTOR		
143	3-675-929-00	o NUT (50P), PLATE		
144	3-675-958-12	o SHOE, C		
145	3-678-601-01	o LABEL, SWITCH		
146	3-682-760-01	o SCREW (M7-0.75), ADJUSTMENT		
147	3-683-255-01	o CAP		
148	3-687-116-01	o WASHER (4), STOPPER		
149	3-692-444-01	o SPACER, BNC INSULATING		
150	3-701-506-01	s SET SCREW, DOUBLE POINT 3X4		
151	3-701-508-00	s SET SCREW, DOUBLE POINT 3X6		
152	3-710-001-01	o COVER, SW INDICATION		
153	3-710-002-01	o BRACKET		
154	3-710-017-01	o PLTE, PROTECTION		
155	3-710-018-01	s COLLAR, SLIDE		

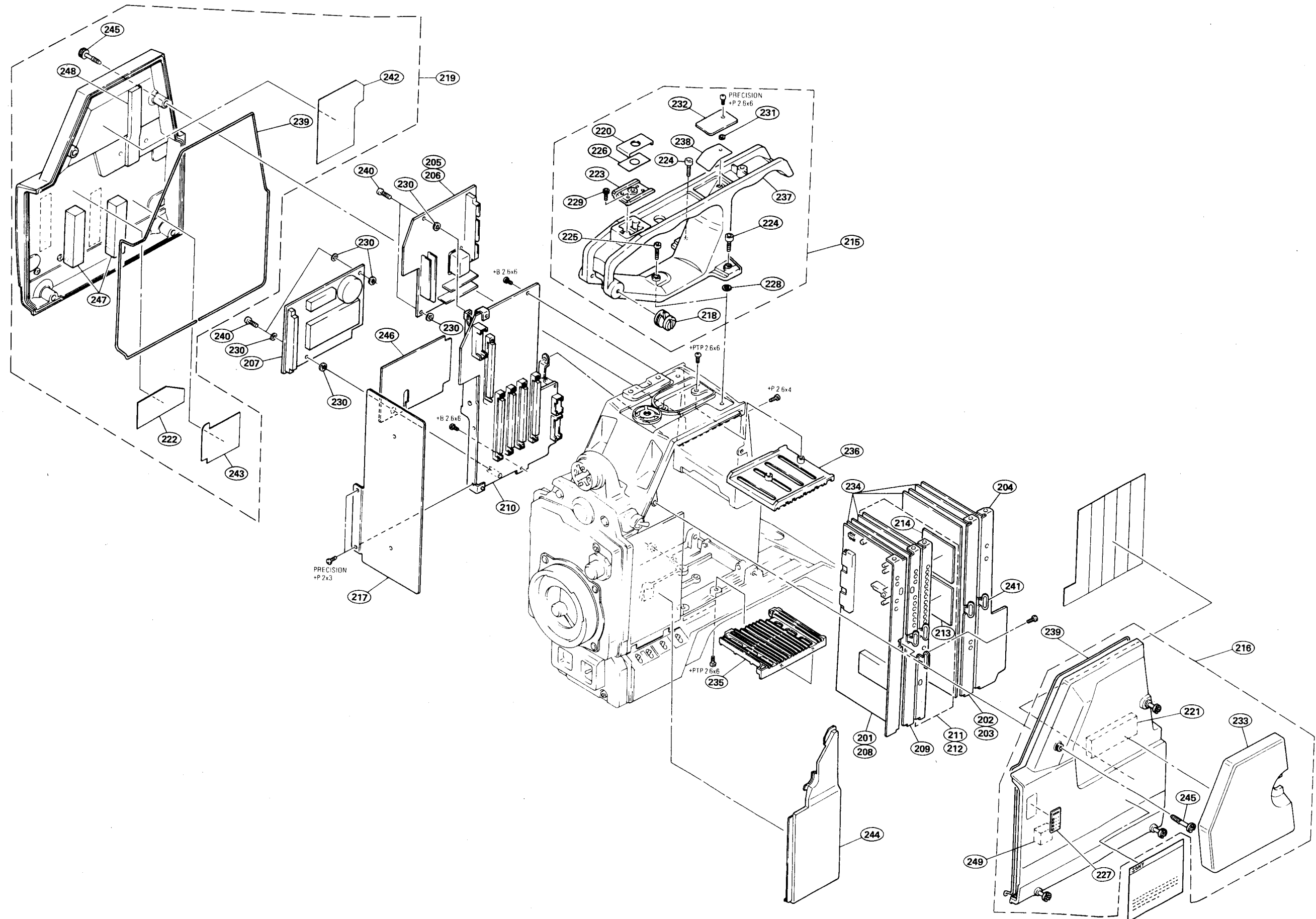
BOARD BLOCK

No.	Part No.	SP Description
201	A-7513-306-A	o MOUNTED CIRCUIT BOARD, IE-25AP (EK)
202	A-7513-618-A	o MOUNTED CIRCUIT BOARD, EN-69 (J,UC)
203	A-7513-619-B	o MOUNTED CIRCUIT BOARD, EN-69P (EK)
204	A-7513-767-A	o MOUNTED CIRCUIT BOARD, PS-173
205	A-7513-768-A	o MOUNTED CIRCUIT BOARD, SG-143 (J,UC)
206	A-7513-769-A	o MOUNTED CIRCUIT BOARD, SG-143P (EK)
207	A-7513-770-A	o MOUNTED CIRCUIT BOARD, AT-52A
208	A-7515-301-A	o MOUNTED CIRCUIT BOARD, IE-25A (J,UC)
209	A-7515-302-A	o MOUNTED CIRCUIT BOARD, VA-121
210	A-7515-303-A	o MOUNTED CIRCUIT BOARD, HN-135A
211	A-7515-338-A	o MOUNTED CIRCUIT BOARD, PR-138D (UC)
212	A-7515-339-A	o MOUNTED CIRCUIT BOARD, PR-138E (J,EK)
213	A-7520-434-A	o MOUNTED CIRCUIT BOARD, PR-139
214	A-7520-435-A	o MOUNTED CIRCUIT BOARD, PR-140
215	X-3165-859-1	o HANDLE ASSY
216	X-3710-005-X	s PANEL ASSY, RIGHT
217	X-3710-007-1	o PLATE ASSY, SHIELD, EN
218	X-3710-037-1	o SUSPENSION ASSY (C)
219	X-3710-049-2	s PANEL ASSY, LEFT
220	2-277-468-01	o PLATE, ORNAMENTAL, CAMERA SHOE
221	2-352-317-01	o CUSHION, PCB
222	3-169-826-01	o LABEL (RG), PC BOARD
223	3-657-700-00	s BRACKET, ACCESSORY
224	3-657-705-00	s BOLT (M4X40), HEXAGON HOLE
225	3-657-705-21	s BOLT (M4X15), HEXAGON HOLE
226	3-672-213-00	o SHEET, ADHESIVE
227	3-678-607-02	o LABEL, FILTER
228	3-687-116-01	o WASHER (4), STOPPER
229	3-689-039-11	s BOLT (M2X6), HOLE, HEXAGON
230	3-699-595-00	s WASHER(2), STOPPER
231	3-701-439-11	s WASHER
232	3-710-015-11	o LID, HANDLE
233	3-710-032-01	s PAD
234	3-710-033-02	o PLATE, SHIELD, PC BOARD
235	3-710-040-02	o GUIDE (B)
236	3-710-041-01	o RAIL (T), GUIDE
237	3-710-044-11	o HANDLE
238	3-710-053-02	o VALVE, ADJUSTMENT
239	3-711-715-01	o RUBBER, SHIELD
240	3-711-765-01	s SCREW, STOPPER
241	3-711-775-01	o LEVER, PULL
242	3-711-783-01	o LABEL (SG), PC BOARD
243	3-711-798-02	o LABEL (AT-2), PC BOARD
244	3-720-963-01	o COVER, OPTICS BLOCK
245	3-729-091-01	s SCREW (M4X17.5)
246	3-742-212-01	o PLATE, SHIELD, AT
247	4-889-014-00	o CUSHION, PCB
248	9-911-840-99	o CUSHION
249	9-911-845-99	s RUBBER (A), ABSORBENT

BOARD BLOCK

BOARD BLOCK

BOARD BLOCK



VIEWFINDER

[illegible]

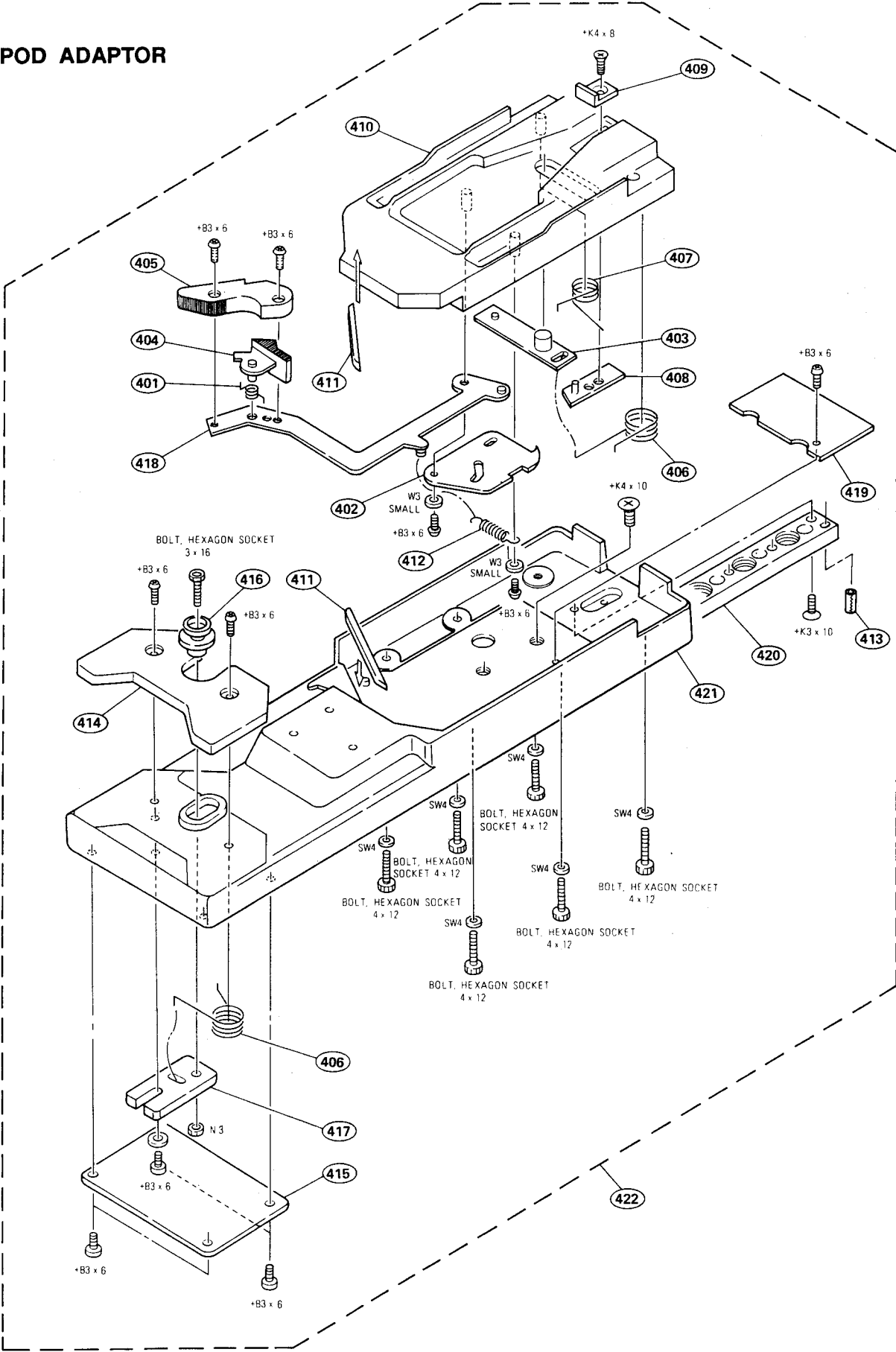
VIEWFINDER

No.	Part No.	SP Description		
301	A-7403-137-A	o VF COMPLETE ASSY (J.UC)	351	3-722-475-04 o COVER (A)
302	A-7403-139-A	o VF COMPLETE ASSY (EK)	352	3-722-476-01 o NUT, PLATE
303	A-7520-469-A	o MOUNTED CIRCUIT BOARD, CN-440	353	3-722-477-01 o BRACKET, SW
304	A-7520-471-A	o LP ASSY	354	3-722-481-04 o HOLDER, PC BOARD
305	A-7520-475-A	o MOUNTED CIRCUIT BOARD, VF-41	355	3-722-485-01 o ROLLER, SLIDE
306	A-7520-476-A	o MOUNTED CIRCUIT BOARD, VR-108	356	3-722-486-01 s KNOB
307	A-7612-389-A	s TUBE SUB ASSY, VF	357	3-722-494-01 o BRACKET, VR SW
308	X-3710-050-5	o VF (MAIN) BLOCK ASSY	358	3-723-002-14 o VF (MAIN)
309	X-3710-055-3	o BRACKET ASSY (B), VR.SW	359	3-723-069-02 o PROTECTOR, MC
310	X-3722-366-7	o TUBE ASSY, VF ROTARY GUIDE	360	3-723-073-01 o CUSHION, MIRROR
311	X-3722-368-5	o LID ASSY, VF	361	3-723-079-01 s EYE CUP
312	X-3722-426-1	o BRACKET ASSY, SW	362	3-724-744-03 o WASHER
313	X-3722-436-1	o LENS ASSY	363	3-724-745-01 o SHEET (C), INSULATING
314	1-238-290-11	s RES, VAR CARBON 1K "CONTRAST"	364	3-724-746-01 o SHEET (B), INSULATING
315	1-238-293-11	s RES, VAR, CARBON 10K "BRIGHT"	365	3-725-220-02 o TUBE (A), CRT
316	1-238-296-11	s RES, VAR, CARBON 10K "AUDIO LEVEL CH-1" "PEAKING"	366	3-725-221-04 o TUBE (B), CRT
317	1-542-106-11	s MICROPHONE	367	3-725-257-01 o BOSS
318	1-546-066-22	s 1.5" CRT ASSY	368	3-725-258-03 o STOPPER, ROTARY
319	1-570-984-11	s SWITCH, TOGGLE "AUDIO/FILTER" "ZEBRA"	369	3-725-277-01 s KNOB (B)
320	1-570-985-11	s SWITCH, TOGGLE "TALLY"	370	3-725-278-01 s PACKING (SW), DROP PROTECTION
321	1-633-206-11	o PRINTED CIRCUIT BOARD, LP-54	371	3-725-279-01 s PACKING (VR), DROP PROTECTION
322	1-633-207-11	o PRINTED CIRCUIT BOARD, LP-55	372	3-725-280-01 s PACKING (A), DROP PROTECTION
323	1-633-208-12	o PRINTED CIRCUIT BOARD, LP-56	373	3-725-282-03 o HINGE, PC BOARD
324	1-633-210-11	o PRINTED CIRCUIT BOARD, SW-425	374	3-729-062-01 o SPACER, MASK
325	1-940-868-12	s HARNESS (VF CABLE)	375	3-729-099-01 o MIRROR
326	2-277-457-00	s KNOB, STOPPER	376	3-729-701-21 s RUBBER (CARBON), CONDUCTIVE
327	2-277-466-01	s SPRING, COMPRESSION	377	3-734-739-01 o SHEET, INSULATING, MASK
328	3-165-162-01	s SCREW (+P2.6X5) (TYPE1)	378	3-734-740-01 o SUPPORT
329	3-166-307-01	o PLATE, SHIELD	379	3-734-760-01 o RING
330	3-335-207-01	s SHAFT, MOTOR	380	3-742-001-01 o HOLDER (2), MIRROR
331	3-573-150-00	o SPRING, COMPRESSION	381	3-742-004-01 s RING, NYLON
332	3-657-654-00	o RING, ORNAMENTAL	382	3-742-038-01 o NUT (2), PLATE
333	3-672-241-00	o RING (B), SLEEVE	383	3-742-045-01 o TUBE
334	3-672-250-00	o RING (M2.6), O	384	3-742-046-01 o BRACKET, SAFETY
335	3-680-595-01	o SUPPORT, ROTARY	385	3-742-052-01 o HOLDER, EYE CUP
336	3-685-104-01	s NUT (M6), CONTROL	386	3-742-053-01 o RING
337	3-685-118-01	o SPACER, RING	387	3-742-054-01 o TUBE
338	3-685-129-01	o SPRING (N), LEAF, VF	388	3-742-058-01 o RING, FIXED
339	3-707-587-01	s SCREEN ASSY, WIND	389	3-742-059-01 o RING, HOLD
340	3-710-007-02	s GUIDE, VF SLIDE	390	3-742-060-01 o HOLDER, RING
341	3-710-008-02	s HOUSING, STOPPER	391	3-742-062-01 o TUBE (2), VF
342	3-716-342-02	o GUARD, CONNECTOR	392	3-742-075-01 o HOLDER, FILTER
343	3-720-946-01	o PIN, MICROPHONE STOPPER	393	3-742-205-02 o BRACKET, CN
344	3-720-954-02	o LABEL, SW.VR	394	3-742-242-01 o PLATE (B), DISPLAY
345	3-720-970-01	s PLATE (A), LIGHT INTERCEPTION		
346	3-720-974-04	o BRACKET (2), PC BOARD		
347	3-720-977-01	o PACKING (A), DROP PROTECTION		
348	3-720-978-01	s PACKING (B), DROP PROTECTION		
349	3-720-997-02	s PLATE, LIGHT INTERCEPTION		
350	3-722-474-05	o BRACKET, LP		

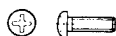
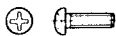
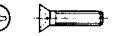
VCT-14

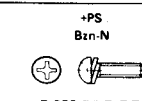
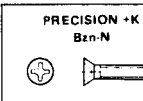
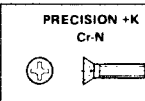
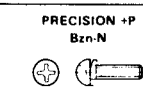
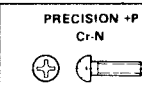
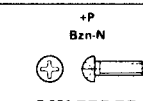
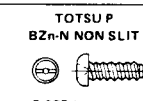
No.	Parts No.	SP Description
401	2-381-631-01	o SPRING
402	2-381-632-01	o ARM, LOCKER
403	2-381-633-01	o SOLENOID
404	2-381-635-01	o LEVER, LOCK
405	2-381-636-01	o KNOB
406	2-381-637-01	o SPRING
407	2-381-638-01	o SPRING
408	2-381-640-01	o DOG
409	2-381-641-01	o COLLAR
410	2-381-642-02	o MOUNT
411	2-381-648-01	o INSULATOR, KNOB
412	2-381-652-01	o SPRING, TENSION
413	2-381-654-01	o PIN, SPRING
414	3-678-704-00	o SPACER
415	3-720-906-01	o LID (S), REAR
416	3-720-907-01	o PIN (S), REAR
417	3-720-908-01	o TABLE (S), PIN, REAR
418	3-720-909-01	o KNOB, CRANK
419	3-720-910-01	o SHEET, SLIDE
420	3-720-911-01	o BASE, TRIPOD FITTING SCREW
421	3-720-912-01	o FRAME (S)
422	OPTIONAL ACCESSORY: TRIPOD ADAPTOR "VCT-14"	

TRIPOD ADAPTOR



SCREWS

+B Bzn-N		+B Bzn-N		+B Cr-N		+K Bzn-N		+K Cr-N		+P Bzn-N			
													
7-621-□□□□□		7-682-□□□□□		7-682-□□□□□		7-621-□□□□□		7-682-□□□□□		7-682-□□□□□			
SIZE	Parts No.	SIZE	Parts No.	SIZE	Parts No.	SIZE	Parts No.	SIZE	Parts No.	SIZE	Parts No.		
2 x 3	772-00	3 x 3	544-09	3 x 3	544-04	2 x 3	555-10	3 x 4	245-09	3 x 4	245-04		
x 4	772-10	x 4	545-09	x 4	545-04	x 4	591-00	x 5	246-09	x 5	246-04		
x 5	772-20	x 5	546-09	x 5	546-04	x 5	555-30	x 6	247-09	x 6	247-04		
x 6	772-30	x 6	547-09	x 6	547-04	x 6	555-40	x 8	248-09	x 8	248-04		
x 8	772-40	x 8	548-09	x 8	548-04	x 8	555-50	x 10	249-09	x 10	249-04		
x 10	772-50	x 10	549-09	x 10	549-04	x 10	555-60	x 12	250-09	x 12	250-04		
x 12	772-60	x 12	550-09	x 12	550-04	x 12	555-70	x 14	251-09	x 14	251-04		
x 14	772-70	x 14	551-09	x 14	551-04	x 14	—	x 16	252-09	x 16	252-04		
x 16	772-80	x 16	552-09	x 16	552-04	x 16	—	x 20	253-09	x 20	253-04		
x 20	—	x 20	553-09	x 20	553-04	x 20	—						
2.6 x 3	775-00	4 x 4	558-09	4 x 4	558-04	2.6 x 4	559-20	4 x 6	260-09	4 x 6	260-04		
x 4	775-10	x 4	559-09	x 5	559-04	x 5	559-30	x 8	261-09	x 8	261-04		
x 5	775-20	x 5	560-09	x 6	560-04	x 6	592-00	x 10	262-09	x 10	262-04		
x 6	773-95	x 6	561-09	x 8	561-04	x 8	592-10	x 12	263-09	x 12	263-04		
x 8	775-40	x 8	562-09	x 10	562-04	x 10	592-20	x 14	264-09	x 14	264-04		
x 10	775-50	x 10	563-09	x 12	563-04	x 12	592-30	x 16	265-09	x 16	265-04		
x 12	775-60	x 12	564-09	x 14	564-04	x 14	559-00	x 20	266-09	x 20	266-04		
x 14	775-70	x 14	565-09	x 16	565-04	x 16	560-00						
x 16	775-80	x 16	566-09	x 20	566-04	x 20	560-20						
x 20	775-90	x 20	566-09	5 x 8	574-04								
		x 10	574-09	x 10	575-04								
		x 12	575-09	x 12	576-04								
		x 14	576-09	x 14	577-04								
		x 16	577-09	x 16	578-04								
		x 18	578-09	x 18	579-04								
		x 20	579-09	x 20	579-04								

+PS Bzn-N		PRECISION +K Bzn-N		PRECISION +K Cr-N		PRECISION +P Bzn-N		PRECISION +P Cr-N		+P Bzn-N		TOTSU P BZN-N NON SLIT	
													
7-682-000-00		7-627-000-00		7-627-000-00		7-627-000-00		7-627-000-00		7-621-000-00		7-685-000-00	
SIZE	Parts No.	SIZE	Parts No.	SIZE	Parts No.	SIZE	Parts No.	SIZE	Parts No.	SIZE	Parts No.	SIZE	Parts No.
2 x 4	253-00	1.7 x 1.8	—	1.7 x 1.8	—	1.7 x 1.6	552-18	1.7 x 1.6	—	2 x 3	255-10	2 x 4	102-19
x 5	253-10	x 2	450-28	x 2	—	x 1.8	—	x 1.8	—	x 4	255-20	2 x 5	103-19
x 6	253-20	x 2.2	—	x 2.2	—	x 2	552-28	x 2	552-27	x 5	283-00	2 x 6	104-19
x 8	253-30	x 2.5	450-48	x 2.5	—	x 2.2	552-87	x 2.2	552-87	x 6	255-40	2 x 8	105-19
x 10	253-40	x 2.8	—	x 2.8	—	x 2.5	552-08	x 2.5	552-07	x 8	255-50	2 x 10	106-19
x 12	253-50	x 3	450-58	x 3	—	x 2.8	—	x 2.8	—	x 10	283-10	2 x 12	107-19
		x 3.5	—	x 3.5	—	x 3	552-38	x 3	552-37	x 12	283-70		
2.6 x 4	253-90	x 4	450-78	x 4	—	x 3.5	552-78	x 3.5	—	x 14	—	2.6 x 4	131-19
x 5	254-00	x 4.5	—	x 4.5	—	x 4	552-48	x 4	552-47	x 16	—	2.6 x 5	132-19
x 6	254-10	x 5	450-98	x 5	—	x 4.5	—	x 4.5	552-67	x 20	256-20	2.6 x 6	133-19
x 8	254-20	x 5.5	—	x 5.5	—	x 5	552-58	x 5	552-57			2.6 x 8	134-19
x 10	254-30	x 6	—	x 6	—	x 5.5	—	x 5.5	557-07	2.3 x 5	—	2.6 x 10	135-19
x 12	254-40					x 6	—	x 6	552-77	x 6	—	2.6 x 12	136-19
x 14	254-90	2 x 2	452-08	2 x 2	452-07			2 x 1.8	554-37	x 8	—	2.6 x 14	137-19
x 16	254-50	x 2.2	452-88	x 2.2	452-87	2 x 1.8	554-38	x 2	553-17	x 10	—		
x 20	254-60	x 2.5	452-48	x 2.5	—	x 2	553-18	x 2.2	554-07	x 12	—		
		x 2.8	—	x 2.8	—	x 2.2	—	x 2.5	553-27	x 14	—		
3 x 5	646-09	x 3	452-18	x 3	452-17	x 2.5	553-28	x 2.8	—	x 16	—	3 x 5	144-19
x 6	647-09	x 3.5	452-98	x 3.5	—	x 2.8	554-58	x 3	553-37	x 20	—	3 x 6	145-19
x 8	648-09	x 4	452-28	x 4	452-27	x 3	553-38	x 3.5	554-17			3 x 8	146-19
x 10	649-09	x 4.5	—	x 4.5	—	x 3.5	554-18	x 4	553-47	2.6 x 3	259-10	3 x 10	147-19
x 12	650-09	x 5	452-38	x 5	—	x 4	553-48	x 4.5	553-57	x 4	284-00	3 x 12	148-19
x 14	651-09	x 5.5	—	x 5.5	—	x 4.5	553-58	x 5	553-67	x 5	284-10	3 x 14	149-19
x 16	652-09	x 6	452-58	x 6	—	x 5	554-28	x 5.5	—	x 6	284-20	3 x 16	150-19
x 20	—	x 7	452-68	x 7	452-67	x 5.5	—	x 6	554-27	x 8	284-30	3 x 18	—
		x 8	452-78	x 8	—	x 6	553-68	x 7	553-87	x 10	284-40	3 x 20	151-19
4 x 6	—	2.6 x 3.5	—	2.6 x 3.5	—	x 7	553-88	x 8	553-97	x 12	259-70	3 x 25	152-19
x 8	—	x 4	—	x 4	454-17	x 8	553-98	x 10	553-78	x 14	259-80	3 x 30	153-19
x 10	—	x 4.5	454-28	x 4.5	—	x 10	553-78			x 16	260-00	3 x 35	154-19
x 12	—	x 5	454-38	x 5	454-37	2.6 x 2.8	556-08	2.6 x 2.8	556-07	x 20	260-20	3 x 40	155-19
x 14	—	x 5.5	—	x 5.5	—	x 3	556-08	x 3	—			3 x 58	—
x 16	—	x 6	—	x 6	—	x 3.5	556-28	x 3.5	—				
x 20	—	x 7	—	x 7	—	x 4	556-38	x 4	556-37				
		x 8	—	x 8	—	x 4.5	556-48	x 4.5	—				
		x 9	—	x 9	—	x 5	556-58	x 5	556-57				
		x 10	—	x 10	—	x 5.5	—	x 5.5	—				
						x 6	556-78	x 6	556-77				
						x 7	—	x 7	—				
						x 8	—	x 8	556-97				
						x 9	—	x 9	—				
						x 10	—	x 10	557-47				

CAPACITOR, CHIP CERAMIC

Part No. SP Description

1-163-083-00	s	CAP, CHIP CERAMIC	1pF	+-0.25pF	50V
1-163-085-00	s	CAP, CHIP CERAMIC	2pF	+-0.25pF	50V
1-163-087-00	s	CAP, CHIP CERAMIC	4pF	+-0.25pF	50V
1-163-089-00	s	CAP, CHIP CERAMIC	6pF	+-0.5pF	50V
1-163-091-00	s	CAP, CHIP CERAMIC	8pF	+-0.5pF	50V

1-163-093-00	s	CAP, CHIP CERAMIC	10pF	5%	50V
1-163-097-00	s	CAP, CHIP CERAMIC	15pF	5%	50V
1-163-101-00	s	CAP, CHIP CERAMIC	22pF	5%	50V
1-163-105-00	s	CAP, CHIP CERAMIC	33pF	5%	50V
1-163-109-00	s	CAP, CHIP CERAMIC	47pF	5%	50V

1-163-113-00	s	CAP, CHIP CERAMIC	68pF	5%	50V
1-163-117-00	s	CAP, CHIP CERAMIC	100pF	5%	50V
1-163-121-00	s	CAP, CHIP CERAMIC	150pF	5%	50V
1-163-125-00	s	CAP, CHIP CERAMIC	220pF	5%	50V
1-163-129-00	s	CAP, CHIP CERAMIC	330pF	5%	50V

1-163-133-00	s	CAP, CHIP CERAMIC	470pF	5%	50V
1-163-137-00	s	CAP, CHIP CERAMIC	680pF	5%	50V
1-163-141-00	s	CAP, CHIP CERAMIC	1000pF	5%	50V
1-163-145-00	s	CAP, CHIP CERAMIC	1500pF	10%	50V
1-164-161-11	s	CAP, CHIP CERAMIC	2200pF	10%	100V

1-164-182-11	s	CAP, CHIP CERAMIC	3300pF	10%	100V
1-163-017-00	s	CAP, CHIP CERAMIC	4700pF	10%	50V
1-163-019-00	s	CAP, CHIP CERAMIC	6800pF	10%	50V
1-164-232-11	s	CAP, CHIP CERAMIC	0.01	20%	100V
1-163-023-00	s	CAP, CHIP CERAMIC	0.015	10%	50V

1-163-034-00	s	CAP, CHIP CERAMIC	0.033		50V
1-163-035-00	s	CAP, CHIP CERAMIC	0.047		50V
1-163-036-00	s	CAP, CHIP CERAMIC	0.068		50V
1-163-038-00	s	CAP, CHIP CERAMIC	0.1		50V

RESISTOR, CHIP

Part No. SP Description

1-216-295-00	s	RES, CHIP	0	5%	1/10W
1-216-298-00	s	RES, CHIP	2.2	5%	1/10W
1-216-302-00	s	RES, CHIP	2.7	5%	1/10W
1-216-304-11	s	RES, CHIP	3.3	5%	1/10W
1-216-306-11	s	RES, CHIP	3.9	5%	1/10W

1-216-308-00	s	RES, CHIP	4.7	5%	1/10W
1-216-309-00	s	RES, CHIP	5.6	5%	1/10W
1-216-311-00	s	RES, CHIP	6.8	5%	1/10W
1-216-313-00	s	RES, CHIP	8.2	5%	1/10W
1-216-001-00	s	RES, CHIP	10	5%	1/10W

1-216-003-11	s	RES, CHIP	12	5%	1/10W
1-216-005-00	s	RES, CHIP	15	5%	1/10W
1-216-007-00	s	RES, CHIP	18	5%	1/10W
1-216-009-00	s	RES, CHIP	22	5%	1/10W
1-216-011-00	s	RES, CHIP	27	5%	1/10W

1-216-013-00	s	RES, CHIP	33	5%	1/10W
1-216-015-00	s	RES, CHIP	39	5%	1/10W
1-216-017-00	s	RES, CHIP	47	5%	1/10W
1-216-019-00	s	RES, CHIP	56	5%	1/10W
1-216-021-00	s	RES, CHIP	68	5%	1/10W

1-216-023-00	s	RES, CHIP	82	5%	1/10W
1-216-025-00	s	RES, CHIP	100	5%	1/10W
1-216-027-00	s	RES, CHIP	120	5%	1/10W
1-216-029-00	s	RES, CHIP	150	5%	1/10W
1-216-031-00	s	RES, CHIP	180	5%	1/10W

1-216-033-00	s	RES, CHIP	220	5%	1/10W
1-216-035-00	s	RES, CHIP	270	5%	1/10W
1-216-037-00	s	RES, CHIP	330	5%	1/10W
1-216-039-00	s	RES, CHIP	390	5%	1/10W
1-216-041-00	s	RES, CHIP	470	5%	1/10W

1-216-043-00	s	RES, CHIP	560	5%	1/10W
1-216-045-00	s	RES, CHIP	680	5%	1/10W
1-216-047-00	s	RES, CHIP	820	5%	1/10W
1-216-049-00	s	RES, CHIP	1k	5%	1/10W
1-216-051-00	s	RES, CHIP	1.2k	5%	1/10W

1-216-053-00	s	RES, CHIP	1.5k	5%	1/10W
1-216-055-00	s	RES, CHIP	1.8k	5%	1/10W
1-216-057-00	s	RES, CHIP	2.2k	5%	1/10W
1-216-059-00	s	RES, CHIP	2.7k	5%	1/10W
1-216-061-00	s	RES, CHIP	3.3k	5%	1/10W

1-216-063-00	s	RES, CHIP	3.9k	5%	1/10W
1-216-065-00	s	RES, CHIP	4.7k	5%	1/10W
1-216-067-00	s	RES, CHIP	5.6k	5%	1/10W
1-216-069-00	s	RES, CHIP	6.8k	5%	1/10W
1-216-071-00	s	RES, CHIP	8.2k	5%	1/10W

1-216-073-00	s	RES, CHIP	10k	5%	1/10W
1-216-075-00	s	RES, CHIP	12k	5%	1/10W
1-216-077-00	s	RES, CHIP	15k	5%	1/10W
1-216-079-00	s	RES, CHIP	18k	5%	1/10W
1-216-081-00	s	RES, CHIP	22k	5%	1/10W

1-216-083-00	s	RES, CHIP	27k	5%	1/10W
1-216-085-00	s	RES, CHIP	33k	5%	1/10W
1-216-748-11	s	RES, CHIP	39k	5%	1/10W
1-216-089-00	s	RES, CHIP	47k	5%	1/10W
1-216-091-00	s	RES, CHIP	56k	5%	1/10W

 RESISTOR, CHIP

Part No. SP Description

1-216-093-00	s RES, CHIP	68k	5%	1/10W
1-216-095-00	s RES, CHIP	82k	5%	1/10W
1-216-097-00	s RES, CHIP	100k	5%	1/10W
1-216-099-00	s RES, CHIP	120k	5%	1/10W
1-216-101-00	s RES, CHIP	150k	5%	1/10W
1-216-103-00	s RES, CHIP	180k	5%	1/10W
1-216-105-00	s RES, CHIP	220k	5%	1/10W
1-216-107-00	s RES, CHIP	270k	5%	1/10W
1-216-109-00	s RES, CHIP	330k	5%	1/10W
1-216-111-00	s RES, CHIP	390k	5%	1/10W
1-216-113-00	s RES, CHIP	470k	5%	1/10W
1-216-115-00	s RES, CHIP	560k	5%	1/10W
1-216-117-00	s RES, CHIP	680k	5%	1/10W
1-216-119-00	s RES, CHIP	820k	5%	1/10W
1-216-121-00	s RES, CHIP	1.0M	5%	1/10W
1-216-123-11	s RES, CHIP	1.2M	5%	1/10W
1-216-125-00	s RES, CHIP	1.5M	5%	1/10W
1-216-127-11	s RES, CHIP	1.8M	5%	1/10W
1-216-129-00	s RES, CHIP	2.2M	5%	1/10W
1-216-131-11	s RES, CHIP	2.7M	5%	1/10W
1-216-133-00	s RES, CHIP	3.3M	5%	1/10W

AT-52A BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7513-770-A	o MOUNTED CIRCUIT BOARD, AT-52A
5pcs	3-621-124-00	o SPACER
4pcs	3-669-595-00	s WASHER (2), STOPPER
2pcs	3-711-767-01	s SCREW, STOPPER
C2	1-131-374-00	s TANTALUM 33uF 10% 16V
C4	1-131-374-00	s TANTALUM 33uF 10% 16V
C6	1-131-374-00	s TANTALUM 33uF 10% 16V
C7	1-131-374-00	s TANTALUM 33uF 10% 16V
C9	1-131-374-00	s TANTALUM 33uF 10% 16V
C14	1-163-251-11	s CERAMIC 100PF 5% 50V
C16	1-131-345-00	s TANTALUM 0.47uF 10% 35V
C18	1-125-446-11	s CAP, DOUBLE LAYERS 0.47F
C19	1-131-377-00	s TANTALUM 10uF 10% 10V
C20	1-163-235-11	s CERAMIC 22PF 5% 50V
C21	1-131-374-00	s TANTALUM 33uF 10% 16V
C23	1-163-235-11	s CERAMIC 22PF 5% 50V
C24	1-131-377-00	s TANTALUM 10uF 10% 10V
C28	1-126-154-11	s ELECT 47uF 20% 6.3V
CN1	1-506-731-21	o CONNECTOR, 40P MALE
CN2	1-506-467-11	o CONNECTOR, 2P, MALE
CN3	1-506-471-11	o CONNECTOR, 6P, MALE
CN4	1-506-468-11	o CONNECTOR, 3P, MALE
CN5	1-506-473-11	o CONNECTOR, 8P, MALE
D1	8-719-400-18	s DIODE MA152WK
D2	8-719-104-34	s DIODE 1S2836
D3	8-719-400-18	s DIODE MA152WK
IC1	1-807-412-12	s IC BH-1219A
IC2	1-807-413-11	s IC BH-1220
IC3	1-807-414-11	s IC BH-1221
IC4	8-759-009-10	s IC MC14069UBF
IC5	8-759-906-54	s IC TL064CNS
IC6	8-759-009-05	s IC MC14051BF
IC7	8-759-101-12	s IC UPC311G2
IC8	8-759-918-65	s IC TL7700CPS
IC9	8-759-204-79	s IC TC40H241F
IC10	8-759-906-53	s IC TL062CPS
IC11	8-759-400-89	s IC MN1237AD
IC12	8-741-100-58	s IC BX-1179A
IC13	8-759-009-10	s IC MC14069UBF
IC14	8-759-322-44	s IC HD6305Y0-D83P
IC16	8-741-100-58	s IC BX-1179A
Q1	8-729-100-66	s TRANSISTOR 2SC1623
Q2	8-729-216-22	s TRANSISTOR 2SA1162
Q3	8-729-100-66	s TRANSISTOR 2SC1623
Q4	8-729-100-66	s TRANSISTOR 2SC1623
Q5	8-729-100-66	s TRANSISTOR 2SC1623
Q6	8-729-216-22	s TRANSISTOR 2SA1162
R41	1-216-685-11	s METAL, CHIP 27K 0.5% 1/10W
R52	1-216-689-11	s METAL, CHIP 39K 0.5% 1/10W
R53	1-216-699-11	s METAL, CHIP 100K 0.5% 1/10W
R54	1-216-691-11	s METAL, CHIP 47K 0.5% 1/10W
RP1	1-235-813-11	s COMPOSITION CIRCUIT BLOCK
RP2	1-235-813-11	s COMPOSITION CIRCUIT BLOCK
RP3	1-231-387-00	s COMPOSITION CIRCUIT BLOCK
RV1	1-237-035-11	s RES, ADJ, METAL 5K
RV2	1-237-034-11	s RES, ADJ, METAL 2K

(AT-52A BOARD)

Ref. No. or Q'ty	Part No.	SP Description
S1	1-570-602-11	s SWITCH, DIP 2-CKT
S2	1-570-374-12	s SWITCH, SLIDE
X1	1-567-192-11	s RESONATOR, CERAMIC 4.00MHz

BI-22 BOARD

Ref. No. or Q'ty	Part No.	SP Description
C1	1-131-350-00	s TANTALUM 3.3uF 10% 35V
C2	1-131-350-00	s TANTALUM 3.3uF 10% 35V
C3	1-131-350-00	s TANTALUM 3.3uF 10% 35V
C5	1-131-350-00	s TANTALUM 3.3uF 10% 35V
C6	1-131-350-00	s TANTALUM 3.3uF 10% 35V
C7	1-163-263-11	s CERAMIC 330PF 5% 50V
C10	1-131-350-00	s TANTALUM 3.3uF 10% 35V
C13	1-131-350-00	s TANTALUM 3.3uF 10% 35V
C14	1-131-350-00	s TANTALUM 3.3uF 10% 35V
CN1	1-562-735-11	o HOUSING, 2P
CN1	1-562-746-11	o HOUSING, CONNECTOR 13P
CN2	1-562-147-11	s HOUSING, 2P
D1	8-719-104-34	s DIODE 1S2836
D2	8-719-104-34	s DIODE 1S2836
D3	8-719-104-34	s DIODE 1S2836
D4	8-719-104-34	s DIODE 1S2836
D5	8-719-104-34	s DIODE 1S2836
Q1	8-729-101-25	s TRANSISTOR 2SC1009A
Q2	8-729-802-45	s TRANSISTOR 2SK125-5

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

BI-23 BOARD

Ref. No. or Q'ty	Part No.	SP Description
C1	1-135-154-21	s TANTAL 3.3uF 20% 20V
C2	1-135-154-21	s TANTAL 3.3uF 20% 20V
C3	1-135-154-21	s TANTAL 3.3uF 20% 20V
C5	1-135-154-21	s TANTAL 3.3uF 20% 20V
C6	1-135-154-21	s TANTAL 3.3uF 20% 20V
C7	1-163-263-11	s CERAMIC 330PF 5% 50V
C10	1-135-154-21	s TANTAL 3.3uF 20% 20V
C13	1-135-154-21	s TANTAL 3.3uF 20% 20V
C14	1-135-154-21	s TANTAL 3.3uF 20% 20V
CN1	1-562-735-11	o HOUSING, 2P
CN1	1-562-746-11	o HOUSING, CONNECTOR 13P
CN2	1-562-147-11	s HOUSING, 2P
D1	8-719-104-34	s DIODE 1S2836
D2	8-719-104-34	s DIODE 1S2836
D3	8-719-104-34	s DIODE 1S2836
D4	8-719-104-34	s DIODE 1S2836
D5	8-719-104-34	s DIODE 1S2836
Q1	8-729-101-25	s TRANSISTOR 2SC1009A
Q2	8-729-802-45	s TRANSISTOR 2SK125-5

BI-24 BOARD

Ref. No. or Q'ty	Part No.	SP Description
C1	1-135-154-21	s TANTAL 3.3uF 20% 20V
C2	1-135-154-21	s TANTAL 3.3uF 20% 20V
C3	1-135-154-21	s TANTAL 3.3uF 20% 20V
C5	1-135-154-21	s TANTAL 3.3uF 20% 20V
C6	1-135-154-21	s TANTAL 3.3uF 20% 20V
C7	1-163-263-11	s CERAMIC 330PF 5% 50V
C10	1-135-154-21	s TANTAL 3.3uF 20% 20V
C13	1-135-154-21	s TANTAL 3.3uF 20% 20V
C14	1-135-154-21	s TANTAL 3.3uF 20% 20V
CN1	1-562-735-11	o HOUSING, 2P
CN1	1-562-746-11	o HOUSING, CONNECTOR 13P
CN2	1-562-147-11	s HOUSING, 2P
D1	8-719-104-34	s DIODE 1S2836
D2	8-719-104-34	s DIODE 1S2836
D3	8-719-104-34	s DIODE 1S2836
D4	8-719-104-34	s DIODE 1S2836
D5	8-719-104-34	s DIODE 1S2836
Q1	8-729-101-25	s TRANSISTOR 2SC1009A
Q2	8-729-802-45	s TRANSISTOR 2SK125-5

CN-189 BOARD

Ref. No. or Q'ty	Part No.	SP Description
C1	1-126-154-11	s ELECT 47uF 20% 6.3V

CN-440 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7520-469-A	o MOUNTED CIRCUIT BOARD, CN-440
1pc	3-742-205-02	o BRACKET, CN
2pcs	7-627-553-47	s SCREW, PRECISION +P 2X4
C1	1-135-160-21	s TANTAL 15uF 10% 16V
CN11	1-566-399-21	o CONNECTOR, 18P, MALE
CN13	1-566-395-11	o CONNECTOR, 10P, MALE
CN14	1-566-394-21	o CONNECTOR, 8P, MALE
L1	1-408-127-41	s INDUCTOR 68UH

DR-72 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7513-757-A	o MOUNTED CIRCUIT BOARD, DR-72
C2	1-163-235-11	s CERAMIC 22PF 5% 50V
C5	1-131-367-00	s TANTALUM 22uF 10% 20V
C21	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C22	1-131-365-00	s TANTALUM 10uF 10% 20V
C23	1-131-365-00	s TANTALUM 10uF 10% 20V
C24	1-131-349-00	s TANTALUM 2.2uF 10% 35V
C25	1-131-374-00	s TANTALUM 33uF 10% 16V
C26	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C27	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C28	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C29	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C30	1-131-345-00	s TANTALUM 0.47uF 10% 35V
C31	1-131-345-00	s TANTALUM 0.47uF 10% 35V
C32	1-131-345-00	s TANTALUM 0.47uF 10% 35V
C33	1-131-345-00	s TANTALUM 0.47uF 10% 35V
C35	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C36	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C37	1-131-345-00	s TANTALUM 0.47uF 10% 35V
C38	1-131-345-00	s TANTALUM 0.47uF 10% 35V
C39	1-131-345-00	s TANTALUM 0.47uF 10% 35V
C40	1-131-345-00	s TANTALUM 0.47uF 10% 35V
C41	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C42	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C43	1-131-345-00	s TANTALUM 0.47uF 10% 35V
C44	1-131-345-00	s TANTALUM 0.47uF 10% 35V
C45	1-131-345-00	s TANTALUM 0.47uF 10% 35V
C46	1-131-345-00	s TANTALUM 0.47uF 10% 35V
C47	1-131-365-00	s TANTALUM 10uF 10% 20V
C48	1-124-360-00	s ELECT 1000uF 20% 16V
C50	1-131-353-00	s TANTALUM 10uF 10% 35V
C54	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C55	1-131-341-00	s TANTALUM 0.1uF 10% 35V
C56	1-131-341-00	s TANTALUM 0.1uF 10% 35V
C57	1-131-341-00	s TANTALUM 0.1uF 10% 35V
C58	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C62	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C63	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C64	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C65	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C66	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C67	1-131-368-00	s TANTALUM 3.3uF 10% 16V
C69	1-124-122-11	s ELECT 100 20% 50V
CN1	1-506-472-11	o CONNECTOR, 7P, MALE
CN2	1-563-238-11	o CONNECTOR, 15P, FEMALE
CN3	1-563-292-11	o CONNECTOR, 30P, FEMALE
D1	8-719-104-34	s DIODE 1S2836
D2	8-719-104-34	s DIODE 1S2836
D3	8-719-400-18	s DIODE MA152WK
D4	8-719-400-18	s DIODE MA152WK
D5	8-719-400-18	s DIODE MA152WK
D6	8-719-400-18	s DIODE MA152WK
D7	8-719-400-18	s DIODE MA152WK
D8	8-719-400-18	s DIODE MA152WK
D9	8-719-400-18	s DIODE MA152WK
D10	8-719-800-76	s DIODE 1SS226
D11	8-719-104-34	s DIODE 1S2836

(DR-72 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
D12	8-719-104-34	s DIODE 1S2836
D13	8-719-104-34	s DIODE 1S2836
D14	8-719-104-34	s DIODE 1S2836
D15	8-719-400-18	s DIODE MA152WK
D16	8-719-400-18	s DIODE MA152WK
D17	8-719-104-34	s DIODE 1S2836
D18	8-719-104-34	s DIODE 1S2836
D19	8-719-104-34	s DIODE 1S2836
D20	8-719-104-34	s DIODE 1S2836
D21	8-719-400-18	s DIODE MA152WK
D22	8-719-400-18	s DIODE MA152WK
D23	8-719-400-18	s DIODE MA152WK
IC1	8-752-031-03	s IC CXA1065M
IC2	8-752-031-03	s IC CXA1065M
IC3	8-752-031-03	s IC CXA1065M
Q1	8-729-100-66	s TRANSISTOR 2SC1623
Q2	8-729-101-00	s TRANSISTOR NTM2369
Q3	8-729-112-65	s TRANSISTOR 2SA1462
Q4	8-729-112-65	s TRANSISTOR 2SA1462
Q5	8-729-101-00	s TRANSISTOR NTM2369
Q6	8-729-100-66	s TRANSISTOR 2SC1623
Q7	8-729-216-22	s TRANSISTOR 2SA1162
Q8	8-729-100-66	s TRANSISTOR 2SC1623
Q9	8-729-100-66	s TRANSISTOR 2SC1623
Q10	8-729-216-22	s TRANSISTOR 2SA1162
Q11	8-729-216-22	s TRANSISTOR 2SA1162
Q12	8-729-802-45	s TRANSISTOR 2SK125-5
Q13	8-729-100-66	s TRANSISTOR 2SC1623
Q14	8-729-100-66	s TRANSISTOR 2SC1623
Q15	8-729-100-66	s TRANSISTOR 2SC1623
Q16	8-729-100-66	s TRANSISTOR 2SC1623
Q17	8-729-100-66	s TRANSISTOR 2SC1623
Q18	8-729-100-66	s TRANSISTOR 2SC1623
Q19	8-729-100-66	s TRANSISTOR 2SC1623
Q20	8-729-100-66	s TRANSISTOR 2SC1623
Q21	8-729-100-66	s TRANSISTOR 2SC1623
R25	1-216-686-11	s METAL, CHIP 30K 0.5% 1/10W
R26	1-216-695-11	s METAL, CHIP 68K 0.5% 1/10W
RV1	1-237-037-11	s RES, ADJ, METAL 20K
RV2	1-237-037-11	s RES, ADJ, METAL 20K
RV3	1-237-037-11	s RES, ADJ, METAL 20K

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

EN-69P BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7513-619-B	o MOUNTED CIRCUIT BOARD, EN-69P
9pcs	3-621-124-00	o SPACER
1pc	3-711-775-01	o LEVER, PULL
3pcs	7-627-556-37	s SCREW,PRECISION +P2.6X4 TYPE 1
C1	1-126-154-11	s ELECT 47uF 20% 6.3V
C2	1-126-154-11	s ELECT 47uF 20% 6.3V
C5	1-126-154-11	s ELECT 47uF 20% 6.3V
C7	1-126-154-11	s ELECT 47uF 20% 6.3V
C9	1-107-042-00	s MICA 2.2PF 500V
C10	1-107-040-00	s MICA 1.5PF 0.5PF 500V
C11	1-131-377-00	s TANTALUM 10uF 10% 10V
C12	1-131-365-00	s TANTALUM 10uF 10% 20V
C15	1-131-374-00	s TANTALUM 33uF 10% 16V
C17	1-126-153-11	s ELECT 22uF 20% 6.3V
C19	1-162-876-11	s CERAMIC 75PF 5% 50V
C20	1-107-075-00	s MICA 39PF 5% 50V
C22	1-124-229-00	s ELECT 33uF 20% 10V
C23	1-126-154-11	s ELECT 47uF 20% 6.3V
C25	1-131-377-00	s TANTALUM 10uF 10% 10V
C26	1-107-043-00	s MICA 2.7PF 500V
C27	1-107-043-00	s MICA 2.7PF 500V
C28	1-107-043-00	s MICA 2.7PF 500V
C38	1-124-229-00	s ELECT 33uF 20% 10V
C41	1-107-042-00	s MICA 2.2PF 500V
C47	1-126-154-11	s ELECT 47uF 20% 6.3V
C48	1-126-154-11	s ELECT 47uF 20% 6.3V
C51	1-162-752-11	s CERAMIC 91PF 5% 50V
C52	1-162-871-11	s CERAMIC 47PF 5% 50V
C53	1-107-206-00	s MICA 15PF 5% 500V
C54	1-162-876-11	s CERAMIC 75PF 5% 50V
C56	1-124-229-00	s ELECT 33uF 20% 10V
C58	1-126-154-11	s ELECT 47uF 20% 6.3V
C61	1-126-154-11	s ELECT 47uF 20% 6.3V
C63	1-124-229-00	s ELECT 33uF 20% 10V
C64	1-124-229-00	s ELECT 33uF 20% 10V
C67	1-124-229-00	s ELECT 33uF 20% 10V
C68	1-124-229-00	s ELECT 33uF 20% 10V
C69	1-162-710-11	s CERAMIC 100PF 1% 50V
C70	1-162-720-11	s CERAMIC 270PF 1% 50V
C73	1-131-345-00	s TANTALUM 0.47uF 10% 35V
C74	1-124-286-00	s ELECT 33uF 20% 10V
C78	1-162-710-11	s CERAMIC 100PF 1% 50V
C79	1-162-720-11	s CERAMIC 270PF 1% 50V
C80	1-126-154-11	s ELECT 47uF 20% 6.3V
C81	1-131-345-00	s TANTALUM 0.47uF 10% 35V
C82	1-124-286-00	s ELECT 33uF 20% 10V
C83	1-124-584-00	s ELECT 100uF 20% 10V
C84	1-124-584-00	s ELECT 100uF 20% 10V
C85	1-131-377-00	s TANTALUM 10uF 10% 10V
C86	1-131-365-00	s TANTALUM 10uF 10% 20V
C87	1-131-377-00	s TANTALUM 10uF 10% 10V
C89	1-131-349-00	s TANTALUM 2.2uF 10% 35V
C93	1-131-377-00	s TANTALUM 10uF 10% 10V
C94	1-124-292-00	s ELECT 33uF 20% 6.3V
C97	1-131-347-00	s TANTALUM 1uF 10% 35V
C98	1-107-042-00	s MICA 2.2PF 500V
C101	1-163-227-11	s CERAMIC 10PF 5% 50V
C102	1-107-158-00	s MICA 30PF 5% 500V
C104	1-163-251-11	s CERAMIC 100PF 5% 50V

(EN-69P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
CN1	1-506-730-11	o CONNECTOR, 40P, MALE
CV1	1-141-298-11	s CAP, CERAMIC TRIMMER 10P
D2	8-719-914-11	s DIODE HZ4ALL
D3	8-719-800-76	s DIODE 1SS226
D4	8-719-400-18	s DIODE MA152WK
D5	8-719-400-18	s DIODE MA152WK
DL1	1-415-483-11	s 338+7nS
FL1	1-235-181-00	s FILTER, BANDPASS 4.43MHZ
IC1	8-759-208-11	s IC TC4053BF
IC2	1-807-421-11	s IC BH-1216
IC3	8-741-135-60	s IC BX-1356
IC4	8-759-906-59	s IC CX22017
IC5	8-759-200-79	s IC TC4049BF
IC6	8-759-911-77	s IC CX-7968A
IC7	1-807-421-11	s IC BH-1216
IC8	1-807-419-11	s IC BH-1214
IC9	1-807-418-11	s IC BH-1213
IC10	1-807-420-12	s IC BH-1215A
IC11	1-807-423-11	s IC BH-1218
IC12	8-759-981-65	s IC LM2903M
IC13	8-759-200-79	s IC TC4049BF
L1	1-408-417-21	s MICRO 47uH
L2	1-408-417-21	s MICRO 47uH
L3	1-408-417-21	s MICRO 47uH
L4	1-408-419-00	s INDUCTOR 68uH
L6	1-408-419-00	s INDUCTOR 68uH
LV1	1-408-844-00	s INDUCTOR, VAR, 22uH
LV2	1-410-619-11	s INDUCTOR, VAR, 220uH
Q1	8-729-216-22	s TRANSISTOR 2SA1162
Q2	8-729-216-22	s TRANSISTOR 2SA1162
Q3	8-729-216-22	s TRANSISTOR 2SA1162
Q4	8-729-100-66	s TRANSISTOR 2SC1623
Q5	8-729-100-66	s TRANSISTOR 2SC1623
Q6	8-729-100-66	s TRANSISTOR 2SC1623
Q7	8-729-100-66	s TRANSISTOR 2SC1623
Q8	8-729-216-22	s TRANSISTOR 2SA1162
Q9	8-729-100-66	s TRANSISTOR 2SC1623
Q10	8-729-100-66	s TRANSISTOR 2SC1623
Q11	8-729-100-66	s TRANSISTOR 2SC1623
Q12	8-729-100-66	s TRANSISTOR 2SC1623
Q13	8-729-100-66	s TRANSISTOR 2SC1623
Q14	8-729-100-66	s TRANSISTOR 2SC1623
Q15	8-729-216-22	s TRANSISTOR 2SA1162
Q16	8-729-100-66	s TRANSISTOR 2SC1623
Q17	8-729-100-66	s TRANSISTOR 2SC1623
Q18	8-729-100-66	s TRANSISTOR 2SC1623
Q19	8-729-100-66	s TRANSISTOR 2SC1623
Q20	8-729-216-22	s TRANSISTOR 2SA1162
Q21	8-729-100-66	s TRANSISTOR 2SC1623
Q25	8-729-122-63	s TRANSISTOR 2SA1226
Q26	8-729-100-66	s TRANSISTOR 2SC1623
Q27	8-729-175-73	s TRANSISTOR 2SC2757
Q28	8-729-100-66	s TRANSISTOR 2SC1623
Q29	8-729-122-63	s TRANSISTOR 2SA1226
Q30	8-729-216-22	s TRANSISTOR 2SA1162

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

(EN-69P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
Q31	8-729-100-66	s TRANSISTOR 2SC1623
Q32	8-729-216-22	s TRANSISTOR 2SA1162
Q33	8-729-216-22	s TRANSISTOR 2SA1162
Q34	8-729-100-66	s TRANSISTOR 2SC1623
Q35	8-729-100-66	s TRANSISTOR 2SC1623
R1	1-214-530-00	s METAL 75 1% 1/8W
R2	1-214-530-00	s METAL 75 1% 1/8W
R20	1-214-585-00	s METAL 15K 1% 1/8W
R24	1-214-568-00	s METAL 3K 1% 1/8W
R25	1-214-550-00	s METAL 510 1% 1/8W
R26	1-214-550-00	s METAL 510 1% 1/8W
R30	1-214-559-00	s METAL 1.2K 1% 1/8W
R31	1-214-509-00	s METAL 10 1% 1/8W
R32	1-214-556-00	s METAL 910 1% 1/8W
R38	1-214-572-00	s METAL 4.3K 1% 1/8W
R40	1-214-557-00	s METAL 1K 1% 1/8W
R41	1-214-557-00	s METAL 1K 1% 1/8W
R46	1-216-642-11	s METAL, CHIP 430 0.5% 1/10W
R47	1-216-642-11	s METAL, CHIP 430 0.5% 1/10W
R56	1-214-569-00	s METAL 3.3K 1% 1/8W
R57	1-214-569-00	s METAL 3.3K 1% 1/8W
R58	1-214-569-00	s METAL 3.3K 1% 1/8W
R60	1-215-830-11	s METAL 100K 1% 1/8W
R61	1-215-830-11	s METAL 100K 1% 1/8W
R62	1-215-830-11	s METAL 100K 1% 1/8W
R63	1-214-593-00	s METAL 33K 1% 1/8W
R64	1-214-593-00	s METAL 33K 1% 1/8W
R65	1-214-593-00	s METAL 33K 1% 1/8W
R78	1-214-585-00	s METAL 15K 1% 1/8W
R79	1-214-568-00	s METAL 3K 1% 1/8W
R80	1-214-569-00	s METAL 3.3K 1% 1/8W
R81	1-214-566-00	s METAL 2.4K 1% 1/8W
R83	1-214-566-00	s METAL 2.4K 1% 1/8W
R84	1-214-569-00	s METAL 3.3K 1% 1/8W
R85	1-214-553-00	s METAL 680 1% 1/8W
R93	1-214-565-00	s METAL 2.2K 1% 1/8W
R99	1-214-565-00	s METAL 2.2K 1% 1/8W
R105	1-214-545-00	s METAL 330 1% 1/8W
R106	1-214-545-00	s METAL 330 1% 1/8W
R109	1-216-654-11	s METAL, CHIP 1.3K 0.5% 1/10W
R110	1-214-551-00	s METAL 560 1% 1/8W
R111	1-214-550-00	s METAL 510 1% 1/8W
R112	1-214-550-00	s METAL 510 1% 1/8W
R115	1-215-830-11	s METAL 100K 1% 1/8W
R128	1-214-557-00	s METAL 1K 1% 1/8W
R129	1-214-589-00	s METAL 22K 1% 1/8W
R130	1-214-589-00	s METAL 22K 1% 1/8W
R131	1-216-699-11	s METAL, CHIP 100K 0.5% 1/10W
R133	1-216-664-11	s METAL, CHIP 3.6K 0.5% 1/10W
R135	1-214-569-00	s METAL 3.3K 1% 1/8W
R140	1-214-557-00	s METAL 1K 1% 1/8W
R141	1-214-589-00	s METAL 22K 1% 1/8W
R142	1-214-589-00	s METAL 22K 1% 1/8W
R145	1-214-583-00	s METAL 12K 1% 1/8W
RP1	1-239-024-11	s MATRIX RESISTOR
RP2	1-239-024-11	s MATRIX RESISTOR
RP3	1-239-025-11	s MATRIX RESISTOR
RP4	1-239-026-11	s MATRIX RESISTOR
RP5	1-239-025-11	s MATRIX RESISTOR

(EN-69P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
RP7	1-239-026-11	s MATRIX RESISTOR
RV2	1-228-459-00	s RES, ADJ, METAL 10K
RV4	1-228-456-00	s RES, ADJ, METAL 1K
RV5	1-228-456-00	s RES, ADJ, METAL 1K
RV6	1-228-457-00	s RES, ADJ, METAL 2K
RV7	1-228-457-00	s RES, ADJ, METAL 2K
RV8	1-228-457-00	s RES, ADJ, METAL 2K
RV11	1-228-459-00	s RES, ADJ, METAL 10K
RV12	1-228-456-00	s RES, ADJ, METAL 1K
RV13	1-228-473-00	s RES, ADJ, METAL 5K
RV14	1-228-457-00	s RES, ADJ, METAL 2K
RV15	1-228-459-00	s RES, ADJ, METAL 10K
RV17	1-228-454-00	s RES, ADJ, CERMET 200
RV18	1-228-454-00	s RES, ADJ, CERMET 200
RV19	1-228-473-00	s RES, ADJ, METAL 5K
RV20	1-228-456-00	s RES, ADJ, METAL 1K
RV21	1-228-473-00	s RES, ADJ, METAL 5K
RV22	1-228-457-00	s RES, ADJ, METAL 2K
RV23	1-228-457-00	s RES, ADJ, METAL 2K
S1	1-570-857-11	s SWITCH, SLIDE
S2	1-570-857-11	s SWITCH, SLIDE
S3	1-570-857-11	s SWITCH, SLIDE

EX-108 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7520-253-A	o MOUNTED CIRCUIT BOARD, EX-108
4pcs	7-622-205-05	s NUT M2 TYPE2
4pcs	7-627-553-67	s SCREW,PRECISION +P 2X5
CN1	1-563-237-11	o CONNECTOR, 40P, FEMALE
CN2	1-506-730-11	o CONNECTOR, 40P, MALE

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

HN-135A BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7515-303-A	o MOUNTED CIRCUIT BOARD, HN-135A
2pcs	1-563-088-11	o CONTACT, FEMALE, AWG24-30
1pc	1-939-724-11	o HARNESS (AT 8P)
1pc	3-710-037-03	s STAY, MB
4pcs	7-627-553-47	s SCREW,PRECISION +P 2X4
1pc	7-627-553-97	s SCREW,PRECISION +P 2X8
2pcs	7-627-556-77	s SCREW,PRECISION +P2.6X6 TYPE 1
1pc	7-688-001-01	s W 2, MIDDLE
CN1	1-562-147-11	s HOUSING, 2P
CN1	1-563-239-21	o CONNECTOR, 40P, MALE
CN2	1-562-153-11	o HOUSING, 8P
CN2	1-562-735-11	o HOUSING, 2P
CN2	1-563-239-11	o CONNECTOR, 40P, MALE
CN3	1-563-239-11	o CONNECTOR, 40P, MALE
CN4	1-563-239-11	o CONNECTOR, 40P, MALE
CN5	1-563-239-11	o CONNECTOR, 40P, MALE
CN6	1-563-239-11	o CONNECTOR, 40P, MALE
CN7	1-563-239-21	o CONNECTOR, 40P, MALE
CN8	1-506-635-11	o CONNECTOR, PS 12P MALE
CN9	1-506-476-11	o CONNECTOR, 11P, MALE
CN10	1-506-482-11	o CONNECTOR, 3P, MALE
CN11	1-506-483-21	o CONNECTOR, 4P, MALE
CN12	1-506-470-11	o CONNECTOR, 5P, MALE
CN13	1-506-489-11	o CONNECTOR, 10P, MALE
CN14	1-506-469-11	o CONNECTOR, 4P, MALE
CN15	1-506-477-11	o CONNECTOR, 12P, MALE
CN16	1-506-484-31	o CONNECTOR, 5P, MALE
CN17	1-506-470-11	o CONNECTOR, 5P, MALE
CN18	1-506-467-11	o CONNECTOR, 2P, MALE
CN20	1-506-639-11	o CONNECTOR, PS 20P, MALE
CN21	1-506-492-11	o CONNECTOR, 13P, MALE
CN22	1-506-485-11	o CONNECTOR, 6P, MALE
CN23	1-506-483-21	o CONNECTOR, 4P, MALE
CN24	1-506-468-11	o CONNECTOR, 3P, MALE
CN25	1-506-470-11	o CONNECTOR, 5P, MALE
CN27	1-506-638-11	o CONNECTOR, PS 18P, MALE
D1	8-719-911-19	s DIODE 1SS119
D2	8-719-911-19	s DIODE 1SS119
D3	8-719-911-19	s DIODE 1SS119
D4	8-719-911-19	s DIODE 1SS119
IC1	8-759-403-48	s IC AN6701S
R5	1-214-581-00	s METAL 10K 1% 1/8W
R6	1-214-583-00	s METAL 12K 1% 1/8W
R7	1-214-586-00	s METAL 16K 1% 1/8W
R8	1-214-590-00	s METAL 24K 1% 1/8W
R9	1-215-821-11	s METAL 43K 1% 1/8W
R11	1-214-541-00	s METAL 220 1% 1/8W

IE-25AP BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7515-306-A	o MOUNTED CIRCUIT BOARD, IE-25AP
6pcs	3-621-124-00	o SPACER
1pc	3-711-775-01	o LEVER, PULL
3pcs	7-627-556-37	s SCREW,PRECISION +P2.6X4 TYPE 1
C2	1-126-157-11	s ELECT 10uF 20% 16V
C3	1-126-157-11	s ELECT 10uF 20% 16V
C5	1-126-157-11	s ELECT 10uF 20% 16V
C7	1-131-367-00	s TANTALUM 22uF 10% 20V
C10	1-107-047-00	s MICA 5.6PF 500V
C12	1-126-157-11	s ELECT 10uF 20% 16V
C16	1-107-159-00	s MICA 33PF 5% 500V
C17	1-131-374-00	s TANTALUM 33uF 10% 16V
C18	1-131-374-00	s TANTALUM 33uF 10% 16V
C19	1-107-159-00	s MICA 33PF 5% 500V
C20	1-107-026-00	s MICA 5.1PF 500V
C21	1-131-381-00	s TANTALUM 47uF 10% 10V
C26	1-163-227-11	s CERAMIC 10PF 5% 50V
C27	1-126-157-11	s ELECT 10uF 20% 16V
C31	1-107-159-00	s MICA 33PF 5% 500V
C32	1-131-374-00	s TANTALUM 33uF 10% 16V
C33	1-131-374-00	s TANTALUM 33uF 10% 16V
C34	1-107-159-00	s MICA 33PF 5% 500V
C35	1-124-229-00	s ELECT 33uF 20% 10V
C37	1-107-208-00	s MICA 18PF 5% 500V
C38	1-124-589-11	s ELECT 47uF 20% 16V
C42	1-161-896-11	s CERAMIC 0.22uF 50V
C43	1-161-896-11	s CERAMIC 0.22uF 50V
C44	1-126-529-11	s ELECT 0.47uF 20% 50V
C45	1-126-529-11	s ELECT 0.47uF 20% 50V
C46	1-161-896-11	s CERAMIC 0.22uF 50V
C47	1-126-529-11	s ELECT 0.47uF 20% 50V
C48	1-126-529-11	s ELECT 0.47uF 20% 50V
C49	1-126-157-11	s ELECT 10uF 20% 16V
C50	1-126-157-11	s ELECT 10uF 20% 16V
C51	1-126-157-11	s ELECT 10uF 20% 16V
C52	1-126-157-11	s ELECT 10uF 20% 16V
C53	1-126-157-11	s ELECT 10uF 20% 16V
C55	1-126-157-11	s ELECT 10uF 20% 16V
C58	1-131-379-00	s TANTALUM 22uF 10% 10V
C61	1-124-234-00	s ELECT 22uF 20% 16V
C64	1-126-157-11	s ELECT 10uF 20% 16V
C67	1-126-157-11	s ELECT 10uF 20% 16V
C72	1-163-116-00	s CERAMIC, CHIP 91PF 5% 50V
C75	1-124-234-00	s ELECT 22uF 20% 16V
C76	1-161-896-11	s CERAMIC 0.22uF 50V
C77	1-126-157-11	s ELECT 10uF 20% 16V
C79	1-107-075-00	s MICA 39PF 5% 50V
C81	1-131-367-00	s TANTALUM 22uF 10% 20V
C82	1-131-374-00	s TANTALUM 33uF 10% 16V
C83	1-131-374-00	s TANTALUM 33uF 10% 16V
C84	1-130-471-00	s MYLAR 0.001uF 5% 50V
C85	1-130-471-00	s MYLAR 0.001uF 5% 50V
C86	1-130-471-00	s MYLAR 0.001uF 5% 50V
C87	1-130-471-00	s MYLAR 0.001uF 5% 50V
C89	1-131-347-00	s TANTALUM 1uF 10% 35V
C96	1-131-374-00	s TANTALUM 33uF 10% 16V
C98	1-126-157-11	s ELECT 10uF 20% 16V
C99	1-124-584-00	s ELECT 100uF 20% 10V
C101	1-131-347-00	s TANTALUM 1uF 10% 35V

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

(IE-25AP BOARD)

Ref. No. or Q'ty	Part No.	SP Description
C102	1-131-377-00	s TANTALUM 10uF 10% 10V
C106	1-131-377-00	s TANTALUM 10uF 10% 10V
C108	1-126-157-11	s ELECT 10uF 20% 16V
C110	1-126-157-11	s ELECT 10uF 20% 16V
C112	1-126-157-11	s ELECT 10uF 20% 16V
C114	1-126-157-11	s ELECT 10uF 20% 16V
C115	1-126-157-11	s ELECT 10uF 20% 16V
C117	1-131-377-00	s TANTALUM 10uF 10% 10V
C120	1-131-347-00	s TANTALUM 1uF 10% 35V
C122	1-131-377-00	s TANTALUM 10uF 10% 10V
C123	1-131-377-00	s TANTALUM 10uF 10% 10V
C125	1-131-377-00	s TANTALUM 10uF 10% 10V
C126	1-131-350-00	s TANTALUM 3.3uF 10% 35V
C127	1-163-235-11	s CERAMIC 22PF 5% 50V
C129	1-124-286-00	s ELECT 33uF 20% 10V
C132	1-124-234-00	s ELECT 22uF 20% 16V
C135	1-131-374-00	s TANTALUM 33uF 10% 16V
C136	1-131-377-00	s TANTALUM 10uF 10% 10V
C137	1-131-347-00	s TANTALUM 1uF 10% 35V
C138	1-163-095-00	s CERAMIC, CHIP 12PF 5% 50V
C142	1-163-088-00	s CERAMIC, CHIP 5PF 50V
C143	1-135-168-21	s TANTALUM 100uF 10% 4V
C145	1-163-086-00	s CERAMIC, CHIP 3PF 50V
C147	1-163-235-11	s CERAMIC 22PF 5% 50V
C148	1-163-127-00	s CERAMIC, CHIP 270PF 5% 50V
CN1	1-506-730-11	o CONNECTOR, 40P, MALE
CV1	1-141-370-11	s CAP, CHIP TRIMMER
CV2	1-141-369-22	s CAP, CHIP TRIMMER
CV3	1-141-311-11	s CAR, TRIMMER 20PF
CV4	1-141-370-11	s CAP, CHIP TRIMMER
D1	8-719-800-76	s DIODE 1SS226
D2	8-719-104-34	s DIODE 1S2836
D3	8-719-104-34	s DIODE 1S2836
D4	8-719-101-97	s DIODE 1SS97-1
D5	8-719-101-97	s DIODE 1SS97-1
D6	8-719-815-59	s DIODE 1S1555-S
D7	8-719-104-34	s DIODE 1S2836
D8	8-719-911-19	s DIODE 1SS119
D9	8-719-948-47	s DIODE HSM88AS
D10	8-719-800-76	s DIODE 1SS226
D11	8-719-101-97	s DIODE 1SS97-1
D12	8-719-101-97	s DIODE 1SS97-1
D13	8-719-800-76	s DIODE 1SS226
DL1	1-415-628-21	s DELAY LINE, ULTRA SONIC
DL2	1-415-689-11	s DELAY LINE 120nS
DL3	1-415-408-11	s DELAY LINE, DUAL 50nS, 100nS
DL4	1-415-502-11	s DELAY LINE 100nS
FL1	1-239-051-11	s FILTER, LOW PASS
IC1	8-759-981-51	s IC RC1496M
IC2	1-807-416-11	s IC BH-1211
IC3	1-807-416-11	s IC BH-1211
IC4	8-759-906-53	s IC TL062CPS
IC5	1-807-422-11	s IC BH-1217
IC6	8-759-906-53	s IC TL062CPS
IC7	8-759-981-51	s IC RC1496M
IC8	8-759-200-90	s IC TC4538BF
IC9	8-759-200-90	s IC TC4538BF

(IE-25AP BOARD)

Ref. No. or Q'ty	Part No.	SP Description
IC10	8-759-008-79	s IC MC14011BF
IC11	8-759-234-77	s IC TC4566F
L1	1-408-417-21	s MICRO 47uH
L4	1-408-421-00	s INDUCTOR 100uH
L5	1-410-510-11	s INDUCTOR 12uH
L6	1-408-170-00	s INDUCTOR 18uH
L7	1-408-421-00	s INDUCTOR 100uH
Q1	8-729-122-63	s TRANSISTOR 2SA1226
Q2	8-729-122-63	s TRANSISTOR 2SA1226
Q3	8-729-122-63	s TRANSISTOR 2SA1226
Q4	8-729-175-73	s TRANSISTOR 2SC2757
Q5	8-729-175-73	s TRANSISTOR 2SC2757
Q6	8-729-109-44	s TRANSISTOR 2SK94
Q7	8-729-175-73	s TRANSISTOR 2SC2757
Q8	8-729-175-73	s TRANSISTOR 2SC2757
Q9	8-729-175-73	s TRANSISTOR 2SC2757
Q10	8-729-175-73	s TRANSISTOR 2SC2757
Q11	8-729-175-73	s TRANSISTOR 2SC2757
Q12	8-729-100-66	s TRANSISTOR 2SC1623
Q13	8-729-175-73	s TRANSISTOR 2SC2757
Q14	8-729-122-63	s TRANSISTOR 2SA1226
Q15	8-729-175-73	s TRANSISTOR 2SC2757
Q16	8-729-175-73	s TRANSISTOR 2SC2757
Q17	8-729-175-73	s TRANSISTOR 2SC2757
Q18	8-729-109-44	s TRANSISTOR 2SK94
Q19	8-729-175-73	s TRANSISTOR 2SC2757
Q20	8-729-175-73	s TRANSISTOR 2SC2757
Q21	8-729-175-73	s TRANSISTOR 2SC2757
Q22	8-729-175-73	s TRANSISTOR 2SC2757
Q23	8-729-175-73	s TRANSISTOR 2SC2757
Q24	8-729-122-63	s TRANSISTOR 2SA1226
Q25	8-729-109-44	s TRANSISTOR 2SK94
Q26	8-729-109-44	s TRANSISTOR 2SK94
Q27	8-729-122-63	s TRANSISTOR 2SA1226
Q28	8-729-122-63	s TRANSISTOR 2SA1226
Q29	8-729-109-44	s TRANSISTOR 2SK94
Q30	8-729-109-44	s TRANSISTOR 2SK94
Q31	8-729-122-63	s TRANSISTOR 2SA1226
Q32	8-729-122-63	s TRANSISTOR 2SA1226
Q33	8-729-122-63	s TRANSISTOR 2SA1226
Q34	8-729-122-63	s TRANSISTOR 2SA1226
Q35	8-729-122-63	s TRANSISTOR 2SA1226
Q36	8-729-122-63	s TRANSISTOR 2SA1226
Q37	8-729-100-66	s TRANSISTOR 2SC1623
Q38	8-729-109-44	s TRANSISTOR 2SK94
Q39	8-729-109-44	s TRANSISTOR 2SK94
Q41	8-729-175-73	s TRANSISTOR 2SC2757
Q42	8-729-175-73	s TRANSISTOR 2SC2757
Q43	8-729-175-73	s TRANSISTOR 2SC2757
Q44	8-729-109-44	s TRANSISTOR 2SK94
Q45	8-729-109-44	s TRANSISTOR 2SK94
Q46	8-729-175-73	s TRANSISTOR 2SC2757
Q47	8-729-100-66	s TRANSISTOR 2SC1623
Q48	8-729-122-63	s TRANSISTOR 2SA1226
Q49	8-729-122-63	s TRANSISTOR 2SA1226
Q50	8-729-100-66	s TRANSISTOR 2SC1623
Q51	8-729-216-22	s TRANSISTOR 2SA1162
Q52	8-729-122-63	s TRANSISTOR 2SA1226

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

(IE-25AP BOARD)

Ref. No. or Q'ty	Part No.	SP Description
Q53	8-729-175-73	s TRANSISTOR 2SC2757
Q54	8-729-175-73	s TRANSISTOR 2SC2757
Q55	8-729-175-73	s TRANSISTOR 2SC2757
Q56	8-729-122-63	s TRANSISTOR 2SA1226
Q57	8-729-122-63	s TRANSISTOR 2SA1226
Q63	8-729-216-22	s TRANSISTOR 2SA1162
Q65	8-729-122-63	s TRANSISTOR 2SA1226
Q66	8-729-100-66	s TRANSISTOR 2SC1623
Q67	8-729-100-66	s TRANSISTOR 2SC1623
Q68	8-729-175-73	s TRANSISTOR 2SC2757
Q69	8-729-175-73	s TRANSISTOR 2SC2757
Q70	8-729-100-66	s TRANSISTOR 2SC1623
Q71	8-729-175-73	s TRANSISTOR 2SC2757
Q72	8-729-122-63	s TRANSISTOR 2SA1226
Q75	8-729-100-66	s TRANSISTOR 2SC1623
Q76	8-729-122-63	s TRANSISTOR 2SA1226
Q77	8-729-175-73	s TRANSISTOR 2SC2757
Q79	8-729-100-66	s TRANSISTOR 2SC1623
Q81	8-729-216-22	s TRANSISTOR 2SA1162
Q82	8-729-100-66	s TRANSISTOR 2SC1623
Q83	8-729-100-66	s TRANSISTOR 2SC1623
Q84	8-729-175-73	s TRANSISTOR 2SC2757
Q85	8-729-175-73	s TRANSISTOR 2SC2757
Q89	8-729-100-66	s TRANSISTOR 2SC1623
Q90	8-729-100-66	s TRANSISTOR 2SC1623
Q91	8-729-122-63	s TRANSISTOR 2SA1226
R7	1-216-627-11	s METAL, CHIP 100 0.5% 1/10W
R8	1-216-669-11	s METAL, CHIP 5.6K 0.5% 1/10W
R10	1-216-647-11	s METAL, CHIP 680 0.5% 1/10W
R13	1-216-641-11	s METAL, CHIP 390 0.5% 1/10W
R14	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R28	1-216-631-11	s METAL, CHIP 150 0.5% 1/10W
R29	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R32	1-216-634-11	s METAL, CHIP 200 0.5% 1/10W
R33	1-216-658-11	s METAL, CHIP 2K 0.5% 1/10W
R34	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R45	1-216-639-11	s METAL, CHIP 330 0.5% 1/10W
R59	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R60	1-216-631-11	s METAL, CHIP 150 0.5% 1/10W
R63	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R79	1-216-658-11	s METAL, CHIP 2K 0.5% 1/10W
R80	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R81	1-216-658-11	s METAL, CHIP 2K 0.5% 1/10W
R82	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R88	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R89	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R91	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R93	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R94	1-216-658-11	s METAL, CHIP 2K 0.5% 1/10W
R108	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R109	1-216-659-11	s METAL, CHIP 2.2K 0.5% 1/10W
R110	1-216-659-11	s METAL, CHIP 2.2K 0.5% 1/10W
R127	1-216-667-11	s METAL, CHIP 4.7K 0.5% 1/10W
R128	1-216-667-11	s METAL, CHIP 4.7K 0.5% 1/10W
R129	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R147	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R148	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R161	1-216-682-11	s METAL, CHIP 20K 0.5% 1/10W

(IE-25AP BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R162	1-216-689-11	s METAL, CHIP 39K 0.5% 1/10W
R163	1-216-679-11	s METAL, CHIP 15K 0.5% 1/10W
R164	1-216-681-11	s METAL, CHIP 18K 0.5% 1/10W
R179	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R184	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R185	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R186	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R187	1-216-664-11	s METAL, CHIP 3.6K 0.5% 1/10W
R188	1-216-657-11	s METAL, CHIP 1.8K 0.5% 1/10W
R191	1-216-657-11	s METAL, CHIP 1.8K 0.5% 1/10W
R195	1-216-658-11	s METAL, CHIP 2K 0.5% 1/10W
R197	1-216-639-11	s METAL, CHIP 330 0.5% 1/10W
R198	1-216-639-11	s METAL, CHIP 330 0.5% 1/10W
R199	1-216-689-11	s METAL, CHIP 39K 0.5% 1/10W
R202	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R203	1-216-633-11	s METAL, CHIP 180 0.5% 1/10W
R253	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R255	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R262	1-216-635-11	s METAL, CHIP 220 0.5% 1/10W
R263	1-216-627-11	s METAL, CHIP 100 0.5% 1/10W
RV1	1-228-457-00	s RES, ADJ, METAL 2K
RV2	1-228-455-00	s RES, ADJ, METAL 500
RV3	1-228-458-00	s RES, ADJ, METAL 5K
RV4	1-228-471-00	s RES, ADJ, METAL 1K
RV5	1-228-474-00	s RES, ADJ, METAL 10K
RV6	1-228-458-00	s RES, ADJ, METAL 5K
RV7	1-228-472-00	s RES, ADJ, METAL 2K
RV8	1-228-470-00	s RES, ADJ, METAL 500
RV9	1-228-458-00	s RES, ADJ, METAL 5K
RV10	1-228-458-00	s RES, ADJ, METAL 5K
RV11	1-228-455-00	s RES, ADJ, METAL 500
RV12	1-228-458-00	s RES, ADJ, METAL 5K
RV14	1-237-038-11	s RES, ADJ, METAL 50K
RV15	1-228-455-00	s RES, ADJ, METAL 500
RV16	1-228-454-00	s RES, ADJ, CERMET 200
RV17	1-237-033-11	s RES, ADJ, METAL 1K
S1	1-570-610-11	s SWITCH, TOGGLE
S2	1-570-857-11	s SWITCH, SLIDE

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

LP-54 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-633-206-11	o PRINTED CIRCUIT BOARD, LP-54
D1	8-719-812-43	s LED TLG124A, GRN
D2	8-719-812-43	s LED TLG124A, GRN
D3	8-719-812-43	s LED TLG124A, GRN
D4	8-719-812-43	s LED TLG124A, GRN
D5	8-719-812-41	s LED TLR124, RED
D6	8-719-812-44	s LED TLO124, ORG
D7	8-719-812-43	s LED TLG124A, GRN

LP-55 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-633-207-11	o PRINTED CIRCUIT BOARD, LP-55
D8	8-719-915-45	s DIODE SLP162B
D9	8-719-915-45	s DIODE SLP162B
D10	8-719-909-20	s DIODE GL-9NG2, GREEN
D11	8-719-909-20	s DIODE GL-9NG2, GREEN

LP-56 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-633-208-12	o PRINTED CIRCUIT BOARD, LP-56
1pc	3-722-474-05	o BRACKET, LP
2pcs	7-627-556-37	s SCREW, PRECISION +P2.6X4 TYPE 1
CN1	1-565-149-11	o PIN, CONNECTOR (ANGLE) 2P
D1	8-719-950-44	s DIODE GL-5LR40, RED
D2	8-719-950-44	s DIODE GL-5LR40, RED

PA-135 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7515-299-A	o MOUNTED CIRCUIT BOARD, PA-135
C1	1-131-367-00	s TANTALUM 22uF 10% 20V
C3	1-163-235-11	s CERAMIC 22PF 5% 50V
C4	1-163-227-11	s CERAMIC 10PF 5% 50V
C8	1-163-235-11	s CERAMIC 22PF 5% 50V
C11	1-131-367-00	s TANTALUM 22uF 10% 20V
C13	1-131-367-00	s TANTALUM 22uF 10% 20V
C14	1-131-367-00	s TANTALUM 22uF 10% 20V
C16	1-163-235-11	s CERAMIC 22PF 5% 50V
C17	1-163-227-11	s CERAMIC 10PF 5% 50V
C19	1-163-235-11	s CERAMIC 22PF 5% 50V
C21	1-163-227-11	s CERAMIC 10PF 5% 50V
C22	1-131-367-00	s TANTALUM 22uF 10% 20V
C24	1-131-367-00	s TANTALUM 22uF 10% 20V
C26	1-131-367-00	s TANTALUM 22uF 10% 20V
C28	1-163-235-11	s CERAMIC 22PF 5% 50V
C29	1-163-235-11	s CERAMIC 22PF 5% 50V
C32	1-163-235-11	s CERAMIC 22PF 5% 50V
C35	1-131-367-00	s TANTALUM 22uF 10% 20V
C37	1-131-367-00	s TANTALUM 22uF 10% 20V
C41	1-163-227-11	s CERAMIC 10PF 5% 50V
C42	1-163-235-11	s CERAMIC 22PF 5% 50V
C45	1-131-367-00	s TANTALUM 22uF 10% 20V
C48	1-163-251-11	s CERAMIC 100PF 5% 50V
C52	1-163-251-11	s CERAMIC 100PF 5% 50V
CN1	1-506-471-11	o CONNECTOR, 6P, MALE
CN2	1-506-469-11	o CONNECTOR, 4P, MALE
CN3	1-563-238-11	o CONNECTOR, 15P, FEMALE
CN4	1-506-467-11	o CONNECTOR, 2P, MALE
CN5	1-506-467-11	o CONNECTOR, 2P, MALE
CN6	1-506-467-11	o CONNECTOR, 2P, MALE
CV1	1-141-311-11	s CAR, TRIMMER 20PF
CV2	1-141-311-11	s CAR, TRIMMER 20PF
CV3	1-141-311-11	s CAR, TRIMMER 20PF
Q1	8-729-122-63	s TRANSISTOR 2SA1226
Q2	8-765-930-08	s TRANSISTOR 3SK163-2
Q3	8-729-100-66	s TRANSISTOR 2SC1623
Q4	8-729-122-63	s TRANSISTOR 2SA1226
Q5	8-765-930-08	s TRANSISTOR 3SK163-2
Q6	8-729-802-80	s TRANSISTOR 2SC3661
Q7	8-729-122-63	s TRANSISTOR 2SA1226
Q8	8-765-930-08	s TRANSISTOR 3SK163-2
Q9	8-729-802-80	s TRANSISTOR 2SC3661
Q10	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q11	8-729-100-66	s TRANSISTOR 2SC1623
Q12	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q13	8-729-100-66	s TRANSISTOR 2SC1623
Q15	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q16	8-729-122-63	s TRANSISTOR 2SA1226
Q17	8-765-930-08	s TRANSISTOR 3SK163-2
Q18	8-729-100-66	s TRANSISTOR 2SC1623
Q19	8-729-122-63	s TRANSISTOR 2SA1226
Q20	8-765-930-08	s TRANSISTOR 3SK163-2
Q21	8-729-802-80	s TRANSISTOR 2SC3661
Q22	8-729-122-63	s TRANSISTOR 2SA1226
Q23	8-765-930-08	s TRANSISTOR 3SK163-2
Q24	8-729-802-80	s TRANSISTOR 2SC3661

(PA-135 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
Q25	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q26	8-729-100-66	s TRANSISTOR 2SC1623
Q27	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q28	8-729-100-66	s TRANSISTOR 2SC1623
Q30	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q31	8-729-216-22	s TRANSISTOR 2SA1162
Q32	8-729-122-63	s TRANSISTOR 2SA1226
Q33	8-765-930-08	s TRANSISTOR 3SK163-2
Q34	8-729-100-66	s TRANSISTOR 2SC1623
Q35	8-729-122-63	s TRANSISTOR 2SA1226
Q36	8-765-930-08	s TRANSISTOR 3SK163-2
Q37	8-729-100-66	s TRANSISTOR 2SC1623
Q39	8-729-122-63	s TRANSISTOR 2SA1226
Q40	8-765-930-08	s TRANSISTOR 3SK163-2
Q41	8-729-100-66	s TRANSISTOR 2SC1623
Q44	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q45	8-729-100-66	s TRANSISTOR 2SC1623
Q46	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q47	8-729-100-66	s TRANSISTOR 2SC1623
Q48	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q49	8-729-122-63	s TRANSISTOR 2SA1226
Q50	8-765-930-08	s TRANSISTOR 3SK163-2
Q51	8-729-802-80	s TRANSISTOR 2SC3661
Q52	8-729-122-63	s TRANSISTOR 2SA1226
Q53	8-765-930-08	s TRANSISTOR 3SK163-2
Q54	8-729-802-80	s TRANSISTOR 2SC3661
Q55	8-729-216-22	s TRANSISTOR 2SA1162
Q56	8-729-216-22	s TRANSISTOR 2SA1162
Q57	8-729-216-22	s TRANSISTOR 2SA1162
R1	1-216-643-11	s METAL, CHIP 470 0.5% 1/10W
R13	1-216-631-11	s METAL, CHIP 150 0.5% 1/10W
R20	1-216-635-11	s METAL, CHIP 220 0.5% 1/10W
R22	1-216-639-11	s METAL, CHIP 330 0.5% 1/10W
R23	1-216-647-11	s METAL, CHIP 680 0.5% 1/10W
R26	1-216-603-11	s METAL, CHIP 10 0.5% 1/10W
R31	1-216-643-11	s METAL, CHIP 470 0.5% 1/10W
R43	1-216-631-11	s METAL, CHIP 150 0.5% 1/10W
R48	1-216-635-11	s METAL, CHIP 220 0.5% 1/10W
R49	1-216-647-11	s METAL, CHIP 680 0.5% 1/10W
R50	1-216-695-11	s METAL, CHIP 68K 0.5% 1/10W
R51	1-216-639-11	s METAL, CHIP 330 0.5% 1/10W
R55	1-216-603-11	s METAL, CHIP 10 0.5% 1/10W
R60	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R61	1-216-643-11	s METAL, CHIP 470 0.5% 1/10W
R74	1-216-631-11	s METAL, CHIP 150 0.5% 1/10W
R78	1-216-635-11	s METAL, CHIP 220 0.5% 1/10W
R82	1-216-647-11	s METAL, CHIP 680 0.5% 1/10W
R84	1-216-639-11	s METAL, CHIP 330 0.5% 1/10W
R88	1-216-603-11	s METAL, CHIP 10 0.5% 1/10W
R101	1-216-664-11	s METAL, CHIP 3.6K 0.5% 1/10W
R104	1-216-664-11	s METAL, CHIP 3.6K 0.5% 1/10W
R107	1-216-670-11	s METAL, CHIP 6.2K 0.5% 1/10W
RV1	1-237-042-11	s RES, ADJ, METAL 1M
RV2	1-237-042-11	s RES, ADJ, METAL 1M
RV3	1-237-042-11	s RES, ADJ, METAL 1M
RV4	1-237-033-11	s RES, ADJ, METAL 1K
RV5	1-237-033-11	s RES, ADJ, METAL 1K
RV6	1-237-033-11	s RES, ADJ, METAL 1K

PR-138E BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7515-339-A	o MOUNTED CIRCUIT BOARD, PR-138E
1pc	3-711-775-01	o LEVER, PULL
3pcs	7-627-556-37	s SCREW,PRECISION +P2.6X4 TYPE 1
C1	1-131-374-00	s TANTALUM 33uF 10% 16V
C2	1-131-381-00	s TANTALUM 47uF 10% 10V
C5	1-124-499-11	s ELECT, NONPOLAR 1uF 20% 50V
C7	1-126-151-11	s ELECT, NONPOLAR 4.7uF 20% 16V
C11	1-163-235-11	s CERAMIC 22PF 5% 50V
C12	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C13	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C17	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C18	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C21	1-124-499-11	s ELECT, NONPOLAR 1uF 20% 50V
C23	1-126-151-11	s ELECT, NONPOLAR 4.7uF 20% 16V
C25	1-163-245-11	s CERAMIC 56PF 5% 50V
C28	1-163-235-11	s CERAMIC 22PF 5% 50V
C29	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C30	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C33	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C34	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C37	1-124-499-11	s ELECT, NONPOLAR 1uF 20% 50V
C39	1-126-151-11	s ELECT, NONPOLAR 4.7uF 20% 16V
C43	1-163-235-11	s CERAMIC 22PF 5% 50V
C44	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C45	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C49	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C50	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C52	1-131-374-00	s TANTALUM 33uF 10% 16V
C53	1-131-374-00	s TANTALUM 33uF 10% 16V
C54	1-131-374-00	s TANTALUM 33uF 10% 16V
C55	1-131-374-00	s TANTALUM 33uF 10% 16V
C56	1-131-374-00	s TANTALUM 33uF 10% 16V
C57	1-131-374-00	s TANTALUM 33uF 10% 16V
C58	1-131-347-00	s TANTALUM 1uF 10% 35V
C59	1-131-381-00	s TANTALUM 47uF 10% 10V
C60	1-131-374-00	s TANTALUM 33uF 10% 16V
C61	1-131-381-00	s TANTALUM 47uF 10% 10V
C63	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C64	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C66	1-124-589-11	s ELECT 47uF 20% 16V
C68	1-135-153-21	s TANTALUM 2.2uF 10% 20V
C70	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C71	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C72	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C73	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C74	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C75	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C76	1-163-086-00	s CERAMIC, CHIP 3PF 50V
C78	1-163-086-00	s CERAMIC, CHIP 3PF 50V
C80	1-163-086-00	s CERAMIC, CHIP 3PF 50V
C81	1-131-374-00	s TANTALUM 33uF 10% 16V
C82	1-163-119-00	s CERAMIC, CHIP 120PF 5% 50V
C83	1-163-119-00	s CERAMIC, CHIP 120PF 5% 50V
C84	1-163-119-00	s CERAMIC, CHIP 120PF 5% 50V
CN1	1-506-730-11	o CONNECTOR, 40P, MALE
CN5	1-568-613-11	o CONNECTOR, FEMALE, 2P
CV1	1-141-331-11	s CAP, VAR, TRIMMER (CHIP)

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

(PR-138E BOARD)

Ref. No. or Q'ty	Part No.	SP Description
CV2	1-141-331-11	s CAP, VAR, TRIMMER (CHIP)
CV3	1-141-331-11	s CAP, VAR, TRIMMER (CHIP)
D3	8-719-914-13	s DIODE HZ4CLL
D4	8-719-800-76	s DIODE 1SS226
D5	8-719-800-76	s DIODE 1SS226
D7	8-719-914-13	s DIODE HZ4CLL
D8	8-719-800-76	s DIODE 1SS226
D11	8-719-914-13	s DIODE HZ4CLL
D12	8-719-800-76	s DIODE 1SS226
D14	8-719-104-34	s DIODE 1S2836
D15	8-719-800-76	s DIODE 1SS226
D16	8-719-800-76	s DIODE 1SS226
D17	8-719-948-47	s DIODE HSM88AS
D18	8-719-948-47	s DIODE HSM88AS
D19	8-719-948-47	s DIODE HSM88AS
D28	8-719-800-76	s DIODE 1SS226
DL1	1-415-490-21	s DELAY LINE
DL2	1-415-490-21	s DELAY LINE
DL3	1-415-490-21	s DELAY LINE
DL4	1-415-449-11	s DELAY LINE
IC1	1-807-422-11	s IC BH-1217
IC2	8-759-906-53	s IC TL062CPS
IC3	8-759-981-51	s IC RC1496M
IC4	8-759-998-12	s IC TL032CPS
IC5	1-807-422-11	s IC BH-1217
IC6	8-759-906-53	s IC TL062CPS
IC7	8-759-981-51	s IC RC1496M
IC8	8-759-998-12	s IC TL032CPS
IC9	1-807-422-11	s IC BH-1217
IC10	8-759-906-53	s IC TL062CPS
IC11	8-759-981-51	s IC RC1496M
IC12	8-759-998-12	s IC TL032CPS
IC13	8-759-300-71	s IC MC14053BF
L1	1-408-417-00	s INDUCTOR 47uH
L2	1-408-417-00	s INDUCTOR 47uH
L3	1-410-709-31	s INDUCTOR, CHIP 22uH
Q1	8-729-100-66	s TRANSISTOR 2SC1623
Q2	8-729-122-63	s TRANSISTOR 2SA1226
Q3	8-729-122-63	s TRANSISTOR 2SA1226
Q4	8-729-109-44	s TRANSISTOR 2SK94
Q5	8-729-122-63	s TRANSISTOR 2SA1226
Q6	8-729-403-29	s TRANSISTOR XN6435
Q7	8-729-403-29	s TRANSISTOR XN6435
Q8	8-729-109-44	s TRANSISTOR 2SK94
Q9	8-729-109-44	s TRANSISTOR 2SK94
Q10	8-765-420-02	s TRANSISTOR 2SK300-3
Q11	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q12	8-729-403-29	s TRANSISTOR XN6435
Q13	8-729-403-32	s TRANSISTOR XN6534
Q14	8-729-109-44	s TRANSISTOR 2SK94
Q15	8-729-403-29	s TRANSISTOR XN6435
Q16	8-729-403-29	s TRANSISTOR XN6435
Q17	8-729-403-32	s TRANSISTOR XN6534
Q19	8-729-403-29	s TRANSISTOR XN6435
Q21	8-729-216-22	s TRANSISTOR 2SA1162
Q22	8-729-122-63	s TRANSISTOR 2SA1226
Q23	8-729-100-66	s TRANSISTOR 2SC1623

(PR-138E BOARD)

Ref. No. or Q'ty	Part No.	SP Description
Q24	8-729-122-63	s TRANSISTOR 2SA1226
Q25	8-729-122-63	s TRANSISTOR 2SA1226
Q26	8-729-109-44	s TRANSISTOR 2SK94
Q27	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q28	8-729-122-63	s TRANSISTOR 2SA1226
Q29	8-729-403-29	s TRANSISTOR XN6435
Q30	8-729-403-29	s TRANSISTOR XN6435
Q31	8-729-109-44	s TRANSISTOR 2SK94
Q32	8-729-109-44	s TRANSISTOR 2SK94
Q33	8-765-420-02	s TRANSISTOR 2SK300-3
Q34	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q35	8-729-403-29	s TRANSISTOR XN6435
Q36	8-729-403-32	s TRANSISTOR XN6534
Q37	8-729-109-44	s TRANSISTOR 2SK94
Q38	8-729-403-29	s TRANSISTOR XN6435
Q39	8-729-403-29	s TRANSISTOR XN6435
Q40	8-729-403-32	s TRANSISTOR XN6534
Q42	8-729-403-29	s TRANSISTOR XN6435
Q43	8-729-100-66	s TRANSISTOR 2SC1623
Q44	8-729-122-63	s TRANSISTOR 2SA1226
Q45	8-729-122-63	s TRANSISTOR 2SA1226
Q46	8-729-109-44	s TRANSISTOR 2SK94
Q47	8-729-122-63	s TRANSISTOR 2SA1226
Q48	8-729-403-29	s TRANSISTOR XN6435
Q49	8-729-403-29	s TRANSISTOR XN6435
Q50	8-729-109-44	s TRANSISTOR 2SK94
Q51	8-729-109-44	s TRANSISTOR 2SK94
Q52	8-765-420-02	s TRANSISTOR 2SK300-3
Q53	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q54	8-729-403-29	s TRANSISTOR XN6435
Q55	8-729-403-32	s TRANSISTOR XN6534
Q56	8-729-109-44	s TRANSISTOR 2SK94
Q57	8-729-403-29	s TRANSISTOR XN6435
Q58	8-729-403-29	s TRANSISTOR XN6435
Q59	8-729-403-32	s TRANSISTOR XN6534
Q61	8-729-403-29	s TRANSISTOR XN6435
Q62	8-729-100-66	s TRANSISTOR 2SC1623
Q63	8-729-403-32	s TRANSISTOR XN6534
Q64	8-729-403-32	s TRANSISTOR XN6534
Q65	8-729-100-66	s TRANSISTOR 2SC1623
Q66	8-729-403-32	s TRANSISTOR XN6534
Q67	8-729-403-32	s TRANSISTOR XN6534
Q68	8-729-100-66	s TRANSISTOR 2SC1623
Q69	8-729-403-32	s TRANSISTOR XN6534
Q70	8-729-216-22	s TRANSISTOR 2SA1162
Q71	8-729-403-32	s TRANSISTOR XN6534
Q72	8-729-122-63	s TRANSISTOR 2SA1226
Q73	8-729-216-22	s TRANSISTOR 2SA1162
Q74	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q75	8-729-100-66	s TRANSISTOR 2SC1623
Q76	8-729-100-66	s TRANSISTOR 2SC1623
Q77	8-729-100-66	s TRANSISTOR 2SC1623
Q78	8-729-403-32	s TRANSISTOR XN6534
R4	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R5	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R7	1-216-641-11	s METAL, CHIP 390 0.5% 1/10W
R8	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R9	1-216-661-11	s METAL, CHIP 2.7K 0.5% 1/10W

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

(PR-138E BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R10	1-216-661-11	s METAL, CHIP 2.7K 0.5% 1/10W
R11	1-216-671-11	s METAL, CHIP 6.8K 0.5% 1/10W
R12	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R14	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R15	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R16	1-216-671-11	s METAL, CHIP 6.8K 0.5% 1/10W
R17	1-216-679-11	s METAL, CHIP 15K 0.5% 1/10W
R18	1-216-667-11	s METAL, CHIP 4.7K 0.5% 1/10W
R20	1-216-687-11	s METAL, CHIP 33K 0.5% 1/10W
R21	1-216-677-11	s METAL, CHIP 12K 0.5% 1/10W
R22	1-216-683-11	s METAL, CHIP 22K 0.5% 1/10W
R23	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R25	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R26	1-216-615-11	s METAL, CHIP 33 0.5% 1/10W
R27	1-216-615-11	s METAL, CHIP 33 0.5% 1/10W
R28	1-216-611-11	s METAL, CHIP 22 0.5% 1/10W
R29	1-216-630-11	s METAL, CHIP 130 0.5% 1/10W
R30	1-216-611-11	s METAL, CHIP 22 0.5% 1/10W
R31	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R32	1-216-634-11	s METAL, CHIP 200 0.5% 1/10W
R33	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R36	1-216-638-11	s METAL, CHIP 300 0.5% 1/10W
R37	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R38	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R39	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R40	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R41	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R42	1-216-642-11	s METAL, CHIP 430 0.5% 1/10W
R43	1-216-619-11	s METAL, CHIP 47 0.5% 1/10W
R44	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R45	1-216-669-11	s METAL, CHIP 5.6K 0.5% 1/10W
R46	1-216-627-11	s METAL, CHIP 100 0.5% 1/10W
R47	1-216-627-11	s METAL, CHIP 100 0.5% 1/10W
R48	1-216-683-11	s METAL, CHIP 22K 0.5% 1/10W
R52	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R54	1-216-639-11	s METAL, CHIP 330 0.5% 1/10W
R60	1-216-683-11	s METAL, CHIP 22K 0.5% 1/10W
R61	1-216-683-11	s METAL, CHIP 22K 0.5% 1/10W
R62	1-216-658-11	s METAL, CHIP 2K 0.5% 1/10W
R65	1-216-699-11	s METAL, CHIP 100K 0.5% 1/10W
R68	1-216-687-11	s METAL, CHIP 33K 0.5% 1/10W
R72	1-216-631-11	s METAL, CHIP 150 0.5% 1/10W
R73	1-216-667-11	s METAL, CHIP 4.7K 0.5% 1/10W
R74	1-216-643-11	s METAL, CHIP 470 0.5% 1/10W
R76	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R82	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R83	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R85	1-216-641-11	s METAL, CHIP 390 0.5% 1/10W
R86	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R87	1-216-661-11	s METAL, CHIP 2.7K 0.5% 1/10W
R88	1-216-661-11	s METAL, CHIP 2.7K 0.5% 1/10W
R89	1-216-671-11	s METAL, CHIP 6.8K 0.5% 1/10W
R90	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R92	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R94	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R95	1-216-667-11	s METAL, CHIP 4.7K 0.5% 1/10W
R96	1-216-671-11	s METAL, CHIP 6.8K 0.5% 1/10W
R97	1-216-679-11	s METAL, CHIP 15K 0.5% 1/10W
R98	1-216-687-11	s METAL, CHIP 33K 0.5% 1/10W

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Ref. No. or Q'ty	Part No.	SP Description
R99	1-216-677-11	s METAL, CHIP 12K 0.5% 1/10W
R100	1-216-683-11	s METAL, CHIP 22K 0.5% 1/10W
R101	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R106	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R107	1-216-615-11	s METAL, CHIP 33 0.5% 1/10W
R108	1-216-615-11	s METAL, CHIP 33 0.5% 1/10W
R109	1-216-611-11	s METAL, CHIP 22 0.5% 1/10W
R110	1-216-630-11	s METAL, CHIP 130 0.5% 1/10W
R111	1-216-611-11	s METAL, CHIP 22 0.5% 1/10W
R112	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R113	1-216-634-11	s METAL, CHIP 200 0.5% 1/10W
R114	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R115	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R117	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R119	1-216-638-11	s METAL, CHIP 300 0.5% 1/10W
R120	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R121	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R122	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R123	1-216-642-11	s METAL, CHIP 430 0.5% 1/10W
R125	1-216-669-11	s METAL, CHIP 5.6K 0.5% 1/10W
R126	1-216-627-11	s METAL, CHIP 100 0.5% 1/10W
R127	1-216-627-11	s METAL, CHIP 100 0.5% 1/10W
R128	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R132	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R133	1-216-669-11	s METAL, CHIP 5.6K 0.5% 1/10W
R135	1-216-669-11	s METAL, CHIP 5.6K 0.5% 1/10W
R138	1-216-639-11	s METAL, CHIP 330 0.5% 1/10W
R142	1-216-658-11	s METAL, CHIP 2K 0.5% 1/10W
R143	1-216-619-11	s METAL, CHIP 47 0.5% 1/10W
R152	1-216-643-11	s METAL, CHIP 470 0.5% 1/10W
R154	1-216-631-11	s METAL, CHIP 150 0.5% 1/10W
R155	1-216-677-11	s METAL, CHIP 12K 0.5% 1/10W
R156	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R160	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R161	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R163	1-216-641-11	s METAL, CHIP 390 0.5% 1/10W
R164	1-216-661-11	s METAL, CHIP 2.7K 0.5% 1/10W
R166	1-216-661-11	s METAL, CHIP 2.7K 0.5% 1/10W
R167	1-216-671-11	s METAL, CHIP 6.8K 0.5% 1/10W
R168	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R170	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R172	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R173	1-216-671-11	s METAL, CHIP 6.8K 0.5% 1/10W
R174	1-216-679-11	s METAL, CHIP 15K 0.5% 1/10W
R175	1-216-667-11	s METAL, CHIP 4.7K 0.5% 1/10W
R176	1-216-687-11	s METAL, CHIP 33K 0.5% 1/10W
R177	1-216-677-11	s METAL, CHIP 12K 0.5% 1/10W
R178	1-216-683-11	s METAL, CHIP 22K 0.5% 1/10W
R180	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R181	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R182	1-216-615-11	s METAL, CHIP 33 0.5% 1/10W
R183	1-216-615-11	s METAL, CHIP 33 0.5% 1/10W
R184	1-216-611-11	s METAL, CHIP 22 0.5% 1/10W
R185	1-216-630-11	s METAL, CHIP 130 0.5% 1/10W
R186	1-216-611-11	s METAL, CHIP 22 0.5% 1/10W
R187	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R188	1-216-634-11	s METAL, CHIP 200 0.5% 1/10W
R189	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R190	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

(PR-138E BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R192	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R194	1-216-638-11	s METAL, CHIP 300 0.5% 1/10W
R195	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R196	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R197	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R198	1-216-619-11	s METAL, CHIP 47 0.5% 1/10W
R199	1-216-642-11	s METAL, CHIP 430 0.5% 1/10W
R200	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R202	1-216-669-11	s METAL, CHIP 5.6K 0.5% 1/10W
R203	1-216-627-11	s METAL, CHIP 100 0.5% 1/10W
R204	1-216-627-11	s METAL, CHIP 100 0.5% 1/10W
R205	1-216-683-11	s METAL, CHIP 22K 0.5% 1/10W
R209	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R210	1-216-669-11	s METAL, CHIP 5.6K 0.5% 1/10W
R211	1-216-669-11	s METAL, CHIP 5.6K 0.5% 1/10W
R215	1-216-639-11	s METAL, CHIP 330 0.5% 1/10W
R219	1-216-658-11	s METAL, CHIP 2K 0.5% 1/10W
R226	1-216-631-11	s METAL, CHIP 150 0.5% 1/10W
R227	1-216-643-11	s METAL, CHIP 470 0.5% 1/10W
R229	1-216-667-11	s METAL, CHIP 4.7K 0.5% 1/10W
R230	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R259	1-216-640-11	s METAL, CHIP 360 0.5% 1/10W
R260	1-216-640-11	s METAL, CHIP 360 0.5% 1/10W
R261	1-216-671-11	s METAL, CHIP 6.8K 0.5% 1/10W
R265	1-216-659-11	s METAL, CHIP 2.2K 0.5% 1/10W
R276	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R277	1-216-667-11	s METAL, CHIP 4.7K 0.5% 1/10W
R278	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R279	1-216-669-11	s METAL, CHIP 5.6K 0.5% 1/10W
R280	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R281	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R282	1-216-699-11	s METAL, CHIP 100K 0.5% 1/10W
R283	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R284	1-216-699-11	s METAL, CHIP 100K 0.5% 1/10W
R285	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R286	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R300	1-216-669-11	s METAL, CHIP 5.6K 0.5% 1/10W
R301	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R304	1-216-699-11	s METAL, CHIP 100K 0.5% 1/10W
RV1	1-237-032-11	s RES, ADJ, METAL 500
RV2	1-228-473-00	s RES, ADJ, METAL 5K
RV3	1-237-034-11	s RES, ADJ, METAL 2K
RV4	1-237-032-11	s RES, ADJ, METAL 500
RV5	1-237-032-11	s RES, ADJ, METAL 500
RV7	1-237-034-11	s RES, ADJ, METAL 2K
RV8	1-228-474-00	s RES, ADJ, METAL 10K
RV9	1-237-032-11	s RES, ADJ, METAL 500
RV10	1-228-473-00	s RES, ADJ, METAL 5K
RV11	1-237-034-11	s RES, ADJ, METAL 2K
RV12	1-228-474-00	s RES, ADJ, METAL 10K
RV13	1-237-032-11	s RES, ADJ, METAL 500
RV15	1-237-035-11	s RES, ADJ, METAL 5K
RV16	1-237-035-11	s RES, ADJ, METAL 5K
RV17	1-237-035-11	s RES, ADJ, METAL 5K
RV18	1-237-035-11	s RES, ADJ, METAL 5K
RV19	1-237-035-11	s RES, ADJ, METAL 5K
RV20	1-237-035-11	s RES, ADJ, METAL 5K
RV22	1-228-473-00	s RES, ADJ, METAL 5K
RV23	1-228-473-00	s RES, ADJ, METAL 5K

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Ref. No. or Q'ty	Part No.	SP Description
RV24	1-228-473-00	s RES, ADJ, METAL 5K
RV25	1-228-476-00	s RES, ADJ, METAL 50K
RV26	1-228-476-00	s RES, ADJ, METAL 50K
RV27	1-228-476-00	s RES, ADJ, METAL 50K
RV31	1-237-035-11	s RES, ADJ, METAL 5K
RV32	1-228-474-00	s RES, ADJ, METAL 10K
RV33	1-228-473-00	s RES, ADJ, METAL 5K
RV34	1-237-032-11	s RES, ADJ, METAL 500
S1	1-570-610-11	s SWITCH, TOGGLE
S3	1-570-857-11	s SWITCH, SLIDE
S4	1-570-857-11	s SWITCH, SLIDE
TH1	1-807-361-11	s THERMISTOR, POSITIVE
TH3	1-807-361-11	s THERMISTOR, POSITIVE
TH5	1-807-361-11	s THERMISTOR, POSITIVE

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

PR-139 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7520-434-A	o MOUNTED CIRCUIT BOARD, PR-139
C2	1-135-157-21	s TANTAL 10uF 10% 6.3V
C3	1-135-091-00	s TANTALUN, CHIP 1uF 10% 16V
C7	1-135-157-21	s TANTAL 10uF 10% 6.3V
C8	1-135-091-00	s TANTALUN, CHIP 1uF 10% 16V
C12	1-135-157-21	s TANTAL 10uF 10% 6.3V
C13	1-135-091-00	s TANTALUN, CHIP 1uF 10% 16V
CN2	1-568-623-11	o CONNECTOR, MAIL, 3P
CN3	1-568-623-11	o CONNECTOR, MAIL, 3P
CN4	1-568-623-11	o CONNECTOR, MAIL, 3P
CN5	1-568-622-11	o CONNECTOR, MAIL, 2P
CN6	1-568-624-11	o CONNECTOR, MAIL, 4P
CN7	1-568-623-11	o CONNECTOR, MAIL, 3P
IC1	8-759-981-51	s IC RC1496M
IC2	8-759-981-51	s IC RC1496M
IC3	8-759-981-51	s IC RC1496M
Q1	8-729-403-32	s TRANSISTOR XN6534
Q2	8-729-109-44	s TRANSISTOR 2SK94
Q3	8-729-402-19	s TRANSISTOR XN6501
Q4	8-729-403-32	s TRANSISTOR XN6534
Q5	8-729-109-44	s TRANSISTOR 2SK94
Q6	8-729-402-19	s TRANSISTOR XN6501
Q7	8-729-403-32	s TRANSISTOR XN6534
Q8	8-729-109-44	s TRANSISTOR 2SK94
Q9	8-729-402-19	s TRANSISTOR XN6501
R22	1-216-686-11	s METAL, CHIP 30K 0.5% 1/10W
R42	1-216-693-11	s METAL, CHIP 56K 0.5% 1/10W
R43	1-216-686-11	s METAL, CHIP 30K 0.5% 1/10W
R62	1-216-693-11	s METAL, CHIP 56K 0.5% 1/10W
R63	1-216-686-11	s METAL, CHIP 30K 0.5% 1/10W
R65	1-215-433-00	s METAL 3.3K 1% 1/6W
R66	1-215-433-00	s METAL 3.3K 1% 1/6W
R68	1-215-433-00	s METAL 3.3K 1% 1/6W
R69	1-216-693-11	s METAL, CHIP 56K 0.5% 1/10W
RV1	1-237-035-11	s RES, ADJ, METAL 5K
RV2	1-237-035-11	s RES, ADJ, METAL 5K
RV3	1-237-035-11	s RES, ADJ, METAL 5K

PR-140 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7520-435-A	o MOUNTED CIRCUIT BOARD, PR-140
C3	1-135-157-21	s TANTAL 10uF 10% 6.3V
C6	1-135-157-21	s TANTAL 10uF 10% 6.3V
C9	1-135-091-00	s TANTALUN, CHIP 1uF 10% 16V
C14	1-135-157-21	s TANTAL 10uF 10% 6.3V
C20	1-135-157-21	s TANTAL 10uF 10% 6.3V
C21	1-163-235-11	s CERAMIC 22PF 5% 50V
CN8	1-568-623-11	o CONNECTOR, MAIL, 3P
CN9	1-568-623-11	o CONNECTOR, MAIL, 3P
D1	8-719-101-97	s DIODE 1SS97-1
D3	8-719-948-47	s DIODE HSM88AS
D4	8-719-101-97	s DIODE 1SS97-1
D5	8-719-101-97	s DIODE 1SS97-1
D6	8-719-104-34	s DIODE 1S2836
IC1	8-759-906-53	s IC TL062CPS
IC2	8-759-906-53	s IC TL062CPS
IC3	8-759-300-71	s IC MC14053BF
IC4	8-759-906-53	s IC TL062CPS
Q1	8-729-403-32	s TRANSISTOR XN6534
Q2	8-729-403-32	s TRANSISTOR XN6534
Q3	8-729-403-32	s TRANSISTOR XN6534
Q4	8-729-109-44	s TRANSISTOR 2SK94
Q5	8-729-403-29	s TRANSISTOR XN6435
R1	1-216-673-11	s METAL, CHIP 8.2K 0.5% 1/10W
R2	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R3	1-216-686-11	s METAL, CHIP 30K 0.5% 1/10W
R4	1-216-686-11	s METAL, CHIP 30K 0.5% 1/10W
R8	1-216-673-11	s METAL, CHIP 8.2K 0.5% 1/10W
R9	1-216-648-11	s METAL, CHIP 750 0.5% 1/10W
R10	1-216-649-11	s METAL, CHIP 820 0.5% 1/10W
R11	1-216-669-11	s METAL, CHIP 5.6K 0.5% 1/10W
R17	1-216-679-11	s METAL, CHIP 15K 0.5% 1/10W
R18	1-216-643-11	s METAL, CHIP 470 0.5% 1/10W
R19	1-216-130-11	s METAL 2.4M 5% 1/10W
R21	1-216-683-11	s METAL, CHIP 22K 0.5% 1/10W
R22	1-216-672-11	s METAL, CHIP 7.5K 0.5% 1/10W
R23	1-216-686-11	s METAL, CHIP 30K 0.5% 1/10W
R24	1-216-683-11	s METAL, CHIP 22K 0.5% 1/10W
R25	1-216-691-11	s METAL, CHIP 47K 0.5% 1/10W
R26	1-216-679-11	s METAL, CHIP 15K 0.5% 1/10W
R27	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R30	1-216-686-11	s METAL, CHIP 30K 0.5% 1/10W
R31	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R32	1-216-686-11	s METAL, CHIP 30K 0.5% 1/10W
R34	1-216-686-11	s METAL, CHIP 30K 0.5% 1/10W
R35	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R36	1-216-656-11	s METAL, CHIP 1.6K 0.5% 1/10W
RV1	1-237-035-11	s RES, ADJ, METAL 5K
RV3	1-237-035-11	s RES, ADJ, METAL 5K
RV4	1-237-034-11	s RES, ADJ, METAL 2K
RV5	1-237-034-11	s RES, ADJ, METAL 2K
RV6	1-237-036-11	s RES, ADJ, METAL 10K
RV7	1-237-034-11	s RES, ADJ, METAL 2K
RV8	1-237-034-11	s RES, ADJ, METAL 2K
RV9	1-237-034-11	s RES, ADJ, METAL 2K
RV10	1-237-034-11	s RES, ADJ, METAL 2K

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

PS-173 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7513-767-A	o MOUNTED CIRCUIT BOARD, PS-173
4pcs	3-621-124-00	o SPACER
1pc	3-711-775-01	o LEVER, PULL
3pcs	7-627-556-37	s SCREW,PRECISION +P2.6X4 TYPE 1
C1	1-131-365-00	s TANTALUM 10uF 10% 20V
C4	1-162-722-11	s CERAMIC 330PF 1% 50V
C5	1-124-479-11	s ELECT 330uF 20% 25V
C6	1-127-519-11	s ELECT (SOLID) 100uF 20% 20V
C7	1-136-173-00	s FILM 0.47uF 5% 50V
C8	1-136-173-00	s FILM 0.47uF 5% 50V
C9	1-127-519-11	s ELECT (SOLID) 100uF 20% 20V
C10	1-163-251-11	s CERAMIC 100PF 5% 50V
C11	1-127-519-11	s ELECT (SOLID) 100uF 20% 20V
C12	1-127-519-11	s ELECT (SOLID) 100uF 20% 20V
C13	1-131-347-00	s TANTALUM 1uF 10% 35V
C14	1-131-347-00	s TANTALUM 1uF 10% 35V
C15	1-131-374-00	s TANTALUM 33uF 10% 16V
C18	1-130-483-00	s MYLAR 0.01uF 5% 50V
C19	1-131-583-11	s TANTALUM 150uF 20% 20V
C20	1-124-140-00	s ELECT 220uF 20% 10V
C21	1-124-120-11	s ELECT 220uF 20% 25V
C22	1-127-515-11	s ELECT (SOLID) 47uF 20% 10V
C23	1-124-242-00	s ELECT 33uF 20% 25V
C24	1-124-589-11	s ELECT 47uF 20% 16V
C25	1-127-518-11	s ELECT (SOLID) 100uF 20% 16V
C26	1-127-515-11	s ELECT (SOLID) 47uF 20% 10V
C27	1-127-518-11	s ELECT (SOLID) 100uF 20% 16V
C28	1-131-381-00	s TANTALUM 47uF 10% 10V
C30	1-126-162-11	s ELECT 3.3uF 20% 50V
C31	1-131-381-00	s TANTALUM 47uF 10% 10V
C33	1-126-157-11	s ELECT 10uF 20% 16V
C34	1-131-370-00	s TANTALUM 6.8uF 10% 16V
C35	1-131-370-00	s TANTALUM 6.8uF 10% 16V
C37	1-124-273-00	s ELECT 3.3uF 20% 50V
C39	1-126-529-11	s ELECT 0.47uF 20% 50V
C40	1-124-499-11	s ELECT, NONPOLAR 1uF 20% 50V
C42	1-124-455-00	s ELECT 100uF 20% 16V
C43	1-126-157-11	s ELECT 10uF 20% 16V
C44	1-126-157-11	s ELECT 10uF 20% 16V
C47	1-126-157-11	s ELECT 10uF 20% 16V
C48	1-124-766-00	s ELECT 0.1uF 20% 50V
C49	1-131-365-00	s TANTALUM 10uF 10% 20V
C51	1-127-519-11	s ELECT (SOLID) 100uF 20% 20V
C56	1-162-724-11	s CERAMIC 390PF 1% 50V
C57	1-131-347-00	s TANTALUM 1uF 10% 35V
C60	1-131-347-00	s TANTALUM 1uF 10% 35V
C61	1-131-353-00	s TANTALUM 10uF 10% 35V
C62	1-131-353-00	s TANTALUM 10uF 10% 35V
CN1	1-506-730-11	o CONNECTOR, 40P, MALE
D2	8-719-118-38	s DIODE 1SZ46A
D3	8-719-981-00	s DIODE ERC81-004
D4	8-719-800-76	s DIODE 1SS226
D5	8-719-800-76	s DIODE 1SS226
D6	8-719-942-31	s DIODE HZ3ALL
D7	8-719-911-55	s DIODE U05G
D9	8-719-400-18	s DIODE MA152WK
D10	8-719-800-76	s DIODE 1SS226
D11	8-719-981-01	s DIODE ERA81-004

(PS-173 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
D12	8-719-981-01	s DIODE ERA81-004
D13	8-719-981-01	s DIODE ERA81-004
D14	8-719-981-01	s DIODE ERA81-004
D15	8-719-981-01	s DIODE ERA81-004
D16	8-719-981-01	s DIODE ERA81-004
D17	8-719-981-01	s DIODE ERA81-004
D18	8-719-981-01	s DIODE ERA81-004
D19	8-719-951-13	s DIODE HZ5CCL
D20	8-719-951-13	s DIODE HZ5CCL
D21	8-719-101-97	s DIODE 1SS97-1
D22	8-719-101-61	s DIODE RD6.2EL2
D23	8-719-400-18	s DIODE MA152WK
D24	8-719-400-18	s DIODE MA152WK
D26	8-719-951-13	s DIODE HZ5CCL
D27	8-719-800-76	s DIODE 1SS226
D28	8-719-800-76	s DIODE 1SS226
D31	8-719-911-19	s DIODE 1SS119
IC1	8-759-914-04	s IC TL494CNS
IC2	8-759-981-69	s IC LM2904M
IC3	8-759-981-69	s IC LM2904M
IC4	8-759-906-54	s IC TL064CNS
IC5	8-759-605-18	s IC CX-518
IC6	8-759-981-69	s IC LM2904M
IC7	8-759-300-71	s IC MC14053BF
L1	1-408-142-21	s 22.5MH
L2	1-408-549-00	s INDUCTOR 150MH
L3	1-421-013-00	s HORIZONTA CHOKE 25uH
L4	1-421-013-00	s HORIZONTA CHOKE 25uH
L5	1-408-427-00	s INDUCTOR 330uH
L6	1-408-423-00	s INDUCTOR 150uH
L7	1-421-013-00	s HORIZONTA CHOKE 25uH
L8	1-421-013-00	s HORIZONTA CHOKE 25uH
L9	1-408-429-00	s INDUCTOR 470uH
Q3	8-729-113-33	s TRANSISTOR 2SB733-4
Q4	8-729-113-33	s TRANSISTOR 2SB733-4
Q8	8-729-230-49	s TRANSISTOR 2SC2712-YG
Q9	8-729-140-93	s TRANSISTOR 2SB739-34
Q10	8-729-216-22	s TRANSISTOR 2SA1162
Q11	8-729-140-98	s TRANSISTOR 2SD773-34
Q12	8-729-140-98	s TRANSISTOR 2SD773-34
Q13	8-729-807-87	s TRANSISTOR 2SB1295-UL6
Q14	8-729-140-93	s TRANSISTOR 2SB739-34
Q15	8-729-177-32	s TRANSISTOR 2SD773
Q17	8-729-216-22	s TRANSISTOR 2SA1162
Q18	8-729-216-22	s TRANSISTOR 2SA1162
Q19	8-729-100-67	s TRANSISTOR 2SC1623-L7
Q21	8-729-230-49	s TRANSISTOR 2SC2712-YG
Q22	8-729-230-49	s TRANSISTOR 2SC2712-YG
Q23	8-729-230-49	s TRANSISTOR 2SC2712-YG
Q24	8-729-216-22	s TRANSISTOR 2SA1162
Q26	8-729-800-37	s TRANSISTOR 2SD1048-X7
Q27	8-729-807-87	s TRANSISTOR 2SB1295-UL6
Q28	8-729-807-87	s TRANSISTOR 2SB1295-UL6
Q29	8-729-230-49	s TRANSISTOR 2SC2712-YG
Q31	8-729-109-44	s TRANSISTOR 2SK94
Q35	8-729-800-37	s TRANSISTOR 2SD1048-X7
R4	1-215-827-11	s METAL 75K 1% 1/8W

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

(PS-173 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R5	1-214-588-00	s METAL 20K 1% 1/8W
R6	1-214-575-00	s METAL 5.6K 1% 1/8W
R7	1-214-574-00	s METAL 5.1K 1% 1/8W
R8	1-214-557-00	s METAL 1K 1% 1/8W
R9	1-214-571-00	s METAL 3.9K 1% 1/8W
R10	1-214-576-00	s METAL 6.2K 1% 1/8W
R11	1-214-561-00	s METAL 1.5k 1% 1/8W
R25	1-214-590-00	s METAL 24K 1% 1/8W
R26	1-214-569-00	s METAL 3.3K 1% 1/8W
R29	1-214-579-00	s METAL 8.2K 1% 1/8W
R30	1-214-589-00	s METAL 22K 1% 1/8W
R45	1-214-581-00	s METAL 10K 1% 1/8W
R46	1-214-581-00	s METAL 10K 1% 1/8W
R47	1-214-580-00	s METAL 9.1K 1% 1/8W
R48	1-214-583-00	s METAL 12K 1% 1/8W
R72	1-214-585-00	s METAL 15K 1% 1/8W
R74	1-214-583-00	s METAL 12K 1% 1/8W
R111	1-214-583-00	s METAL 12K 1% 1/8W
RV1	1-228-457-00	s RES, ADJ, METAL 2K
RV2	1-228-456-00	s RES, ADJ, METAL 1K
RV3	1-228-457-00	s RES, ADJ, METAL 2K
RV4	1-228-475-00	s RES, ADJ, METAL 20K
RV5	1-228-472-00	s RES, ADJ, METAL 2K
RV6	1-228-461-00	s RES, ADJ, CERMET 50K
S1	1-553-510-00	s SWITCH, SLIDE
S2	1-570-857-11	s SWITCH, SLIDE
T1	1-448-363-21	s TRANSFORMER, DC-DC CONVERTER

RG-25AP BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7515-304-A	o MOUNTED CIRCUIT BOARD, RG-25AP
1pc	3-168-886-01	o CASE, SHIELD
C2	1-131-381-00	s TANTALUM 47uF 10% 10V
C5	1-131-381-00	s TANTALUM 47uF 10% 10V
C7	1-131-374-00	s TANTALUM 33uF 10% 16V
C9	1-135-072-21	s TANTALUM, CHIP 0.22uF 10% 35V
C17	1-135-157-21	s TANTAL 10uF 10% 6.3V
C18	1-135-072-21	s TANTALUM, CHIP 0.22uF 10% 35V
CN1	1-506-467-11	o CONNECTOR, 2P, MALE
CN2	1-506-472-11	o CONNECTOR, 7P, MALE
CN3	1-506-476-11	o CONNECTOR, 11P, MALE
CN4	1-506-467-11	o CONNECTOR, 2P, MALE
CN5	1-565-137-11	o PIN, CONNECTOR (STRAIGHT) 4P
D1	8-719-948-47	s DIODE HSM88AS
D2	8-719-104-34	s DIODE 1S2836
D3	8-719-104-34	s DIODE 1S2836
D4	8-719-104-34	s DIODE 1S2836
IC1	8-759-200-79	s IC TC4049BF
IC2	8-741-158-80	s IC SBX1588-01
IC3	8-759-300-71	s IC MC14053BF
IC4	8-759-230-99	s IC TC74HC4053AF
IC5	8-759-906-53	s IC TL062CPS
IC6	1-807-422-11	s IC BH-1217
IC7	8-759-209-97	s IC TC4S81F
L1	1-410-713-31	s INDUCTOR, CHIP 47uH
Q1	8-729-216-22	s TRANSISTOR 2SA1162
Q2	8-729-216-22	s TRANSISTOR 2SA1162
Q3	8-729-100-66	s TRANSISTOR 2SC1623
Q4	8-729-403-32	s TRANSISTOR XN6534
R11	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R16	1-216-624-11	s METAL, CHIP 75 0.5% 1/10W
R42	1-216-673-11	s METAL, CHIP 8.2K 0.5% 1/10W
R43	1-216-641-11	s METAL, CHIP 390 0.5% 1/10W
R44	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R45	1-216-683-11	s METAL, CHIP 22K 0.5% 1/10W
RV1	1-228-455-00	s RES, ADJ, METAL 500
RV2	1-228-457-00	s RES, ADJ, METAL 2K
S1	1-570-609-11	s SWITCH, TOGGLE
S2	1-570-608-11	s SWITCH, TOGGLE
S3	1-570-988-11	s SWITCH, TOGGLE
S4	1-570-839-11	s SWITCH, SLIDE
S5	1-570-602-11	s SWITCH, DIP 2-CKT

RG-26 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-638-292-11	o PRINTED CIRCUIT BOARD, RG-26
CN1	1-565-137-11	o PIN, CONNECTOR (STRAIGHT) 4P
IC1	8-759-153-63	s IC CXD8154AM
L1	1-410-693-21	s INDUCTOR CHIP 1uH
L2	1-410-720-61	s INDUCTOR CHIP 180uH
L3	1-410-693-21	s INDUCTOR CHIP 1uH

SG-143P BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7513-769-A	o MOUNTED CIRCUIT BOARD, SG-143P
4pcs	3-621-124-00	o SPACER
2pcs	3-669-595-00	s WASHER (2), STOPPER
2pcs	3-711-767-01	s SCREW, STOPPER
C1	1-131-377-00	s TANTALUM 10uF 10% 10V
C3	1-131-377-00	s TANTALUM 10uF 10% 10V
C6	1-131-377-00	s TANTALUM 10uF 10% 10V
C8	1-162-710-11	s CERAMIC 100PF 1% 50V
C9	1-131-377-00	s TANTALUM 10uF 10% 10V
C11	1-163-227-11	s CERAMIC 10PF 5% 50V
C13	1-131-347-00	s TANTALUM 1uF 10% 35V
C15	1-131-365-00	s TANTALUM 10uF 10% 20V
C17	1-131-360-00	s TANTALUM 15uF 10% 10V
C20	1-131-349-00	s TANTALUM 2.2uF 10% 35V
C22	1-131-377-00	s TANTALUM 10uF 10% 10V
C25	1-131-377-00	s TANTALUM 10uF 10% 10V
C28	1-131-365-00	s TANTALUM 10uF 10% 20V
C29	1-131-377-00	s TANTALUM 10uF 10% 10V
C32	1-162-669-11	s CERAMIC 15PF 5% 50V
C33	1-162-674-11	s CERAMIC 39PF 5% 50V
C35	1-131-377-00	s TANTALUM 10uF 10% 10V
C36	1-131-365-00	s TANTALUM 10uF 10% 20V
C38	1-162-718-11	s CERAMIC 220PF 1% 50V
C43	1-107-208-00	s MICA 18PF 5% 500V
C44	1-131-377-00	s TANTALUM 10uF 10% 10V
C47	1-162-673-11	s CERAMIC 33PF 5% 50V
C48	1-163-251-11	s CERAMIC 100PF 5% 50V
C49	1-102-951-00	s CERAMIC 15PF 5% 50V
C50	1-131-377-00	s TANTALUM 10uF 10% 10V
C51	1-163-119-00	s CERAMIC, CHIP 120PF 5% 50V
C54	1-131-370-00	s TANTALUM 6.8uF 10% 16V
C56	1-163-011-11	s CERAMIC, CHIP 0.0015uF 10% 50V
CN1	1-506-731-21	o CONNECTOR, 40P MALE
D1	8-719-800-76	s DIODE 1SS226
D2	8-719-800-76	s DIODE 1SS226
D3	8-719-948-47	s DIODE HSM88AS
D4	8-719-921-12	s DIODE HZ2BLL
D5	8-719-104-34	s DIODE 1S2836
D6	8-719-400-18	s DIODE MA152WK
D7	8-719-911-19	s DIODE 1SS119
D8	8-719-104-34	s DIODE 1S2836
D9	8-719-104-34	s DIODE 1S2836
D10	8-719-948-47	s DIODE HSM88AS
IC1	8-752-332-67	s IC CXD1217M
IC2	8-759-907-21	s IC CX-7969
IC3	8-759-300-71	s IC MC14053BF
IC4	8-759-200-79	s IC TC4049BF
IC5	8-759-200-79	s IC TC4049BF
IC6	8-759-204-93	s IC TC50H001F
IC7	8-759-906-53	s IC TL062CPS
IC8	1-809-046-11	s HYBRID IC
IC9	8-741-101-33	s IC SBX1649-01
IC10	8-759-239-34	s IC TC74HC4538AF
IC11	1-808-514-11	s IC IB-37
IC12	8-759-300-71	s IC MC14053BF
IC13	1-808-513-12	s IC IB-38
IC14	8-759-929-21	s IC TLC27L2CPS
IC15	8-759-973-99	s IC CXD1361M

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

(SG-143P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
L1	1-408-978-21 s	INDUCTOR 47uH
L2	1-408-978-21 s	INDUCTOR 47uH
L3	1-408-417-21 s	MICRO 47uH
L4	1-408-417-21 s	MICRO 47uH
L5	1-408-417-21 s	MICRO 47uH
L6	1-408-170-00 s	INDUCTOR 18uH
L7	1-408-417-21 s	MICRO 47uH
L8	1-410-513-11 s	INDUCTOR 22uH
L9	1-410-517-11 s	INDUCTOR 47uH
L10	1-408-417-21 s	MICRO 47uH
L11	1-408-417-21 s	MICRO 47uH
L12	1-408-417-21 s	MICRO 47uH
L13	1-410-517-11 s	INDUCTOR 47uH
Q2	8-729-216-22 s	TRANSISTOR 2SA1162
Q3	8-729-216-22 s	TRANSISTOR 2SA1162
Q4	8-729-216-22 s	TRANSISTOR 2SA1162
Q5	8-729-216-22 s	TRANSISTOR 2SA1162
Q6	8-729-175-73 s	TRANSISTOR 2SC2757
Q7	8-729-216-22 s	TRANSISTOR 2SA1162
Q8	8-729-100-66 s	TRANSISTOR 2SC1623
Q9	8-729-216-22 s	TRANSISTOR 2SA1162
R32	1-214-581-00 s	METAL 10K 1% 1/8W
R33	1-215-473-00 s	METAL 150K 1% 1/6W
R40	1-216-679-11 s	METAL, CHIP 15K 0.5% 1/10W
R41	1-214-589-00 s	METAL 22K 1% 1/8W
R42	1-214-589-00 s	METAL 22K 1% 1/8W
R44	1-216-680-11 s	METAL, CHIP 16K 0.5% 1/10W
R67	1-216-663-11 s	METAL, CHIP 3.3K 0.5% 1/10W
R68	1-216-699-11 s	METAL, CHIP 100K 0.5% 1/10W
R69	1-216-691-11 s	METAL, CHIP 47K 0.5% 1/10W
R71	1-216-667-11 s	METAL, CHIP 4.7K 0.5% 1/10W
RV1	1-228-460-00 s	RES, ADJ, METAL 20K
RV3	1-228-474-00 s	RES, ADJ, METAL 10K
RV4	1-228-475-00 s	RES, ADJ, METAL 20K
RV5	1-228-460-00 s	RES, ADJ, METAL 20K
S1	1-553-925-00 s	SWITCH, DIGITAL
S4	1-570-857-11 s	SWITCH, SLIDE
S5	1-570-857-11 s	SWITCH, SLIDE
S6	1-570-374-12 s	SWITCH, SLIDE
S7	1-570-857-11 s	SWITCH, SLIDE
X1	1-567-654-11 s	VCO, CRYSTAL 17.734475MHZ

SW-114 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7520-249-B o	MOUNTED CIRCUIT BOARD, SW-114
1pc	1-618-176-12 o	PRINTED CIRCUIT BOARD, SW-114
R1	1-249-405-11 s	CARBON 100 5% 1/4W
S1	1-552-539-00 s	SWITCH, TACTILE

SW-115A BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-618-175-12 o	PRINTED CIRCUIT BOARD, SW-115
CN1	1-506-469-11 o	CONNECTOR, 4P, MALE
CN2	1-506-467-11 o	CONNECTOR, 2P, MALE
D1	8-719-910-98 s	DIODE HZ9C2L
D2	8-719-911-19 s	DIODE 1SS119
D3	8-719-911-19 s	DIODE 1SS119
D4	8-719-911-19 s	DIODE 1SS119
R1	1-249-423-11 s	CARBON 3.3K 5% 1/4W
R2	1-249-429-11 s	CARBON 10K 5% 1/4W
R3	1-249-429-11 s	CARBON 10K 5% 1/4W
S1	1-554-356-00 s	SWITCH, TOGGLE
S2	1-554-400-00 s	SWITCH, TOGGLE
S3	1-554-400-00 s	SWITCH, TOGGLE
S4	1-554-356-00 s	SWITCH, TOGGLE

SW-116 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-618-177-11 o	PRINTED CIRCUIT BOARD, SW-116
CN1	1-506-484-11 o	CONNECTOR, 5P, MALE
S1	1-554-395-00 s	SWITCH, TOGGLE

SW-256 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-562-147-11 s	HOUSING, 2P
1pc	1-562-735-11 o	HOUSING, 2P
1pc	1-563-088-11 o	CONTACT, FEMALE, AWG24-30
1pc	1-623-749-11 o	PRINTED CIRCUIT BOARD, SW-256
CN1	1-506-484-11 o	CONNECTOR, 5P, MALE
S1	1-554-396-00 s	SWITCH, TOGGLE

SW-425 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-633-210-11	o PRINTED CIRCUIT BOARD, SW-425
CN1	1-566-393-21	o CONNECTOR, 6P, MALE
S1	1-570-984-11	s SWITCH, TOGGLE
S2	1-570-984-11	s SWITCH, TOGGLE
S3	1-570-985-11	s SWITCH, TOGGLE

SW-481A BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7520-542-A	o MOUNTED CIRCUIT BOARD, SW-481A
C1	1-125-507-11	s CAP, DOUBLE LAYERS 0.22F
C2	1-135-076-21	s TANTALUM, CHIP 1uF 10% 35V
C4	1-135-177-21	s TANTALUM CHIP 1uF 10% 25V
C5	1-135-161-21	s TANTALUM, CHIP 22uF 10% 10V
CN1	1-506-475-11	o CONNECTOR, 10P, MALE
CN2	1-565-143-11	o CONNECTOR, 10P, MALE
CN3	1-565-137-11	o PIN, CONNECTOR (STRAIGHT) 4P
CN4	1-565-137-11	o PIN, CONNECTOR (STRAIGHT) 4P
D1	8-719-104-34	s DIODE 1S2836
D2	8-719-104-34	s DIODE 1S2836
D3	8-719-104-34	s DIODE 1S2836
IC1	8-759-209-97	s IC TC4S81F
IC2	8-759-209-69	s IC TC4S11F
IC3	8-759-009-25	s IC MC14161BF
IC4	8-759-008-37	s IC MC74HC4050F
L1	1-410-713-31	s INDUCTOR, CHIP 47uH
S1	1-570-986-11	s SWITCH, TOGGLE

VA-121 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7515-302-A	o MOUNTED CIRCUIT BOARD, VA-121
2pcs	3-621-124-00	o SPACER
1pc	3-711-775-01	o LEVER, PULL
3pcs	7-627-556-37	s SCREW,PRECISION +P2.6X4 TYPE 1
C1	1-126-529-11	s ELECT 0.47uF 20% 50V
C2	1-131-379-00	s TANTALUM 22uF 10% 10V
C3	1-135-165-11	s TANTAL 33uF 10% 16V
C4	1-126-154-11	s ELECT 47uF 20% 6.3V
C5	1-126-154-11	s ELECT 47uF 20% 6.3V
C12	1-131-370-00	s TANTALUM 6.8uF 10% 16V
C13	1-131-370-00	s TANTALUM 6.8uF 10% 16V
C17	1-102-965-00	s CERAMIC 39PF 5% 50V
C19	1-126-160-11	s ELECT 1uF 20% 50V
C22	1-126-154-11	s ELECT 47uF 20% 6.3V
C23	1-135-161-21	s TANTALUM, CHIP 22uF 10% 10V
C24	1-135-165-11	s TANTAL 33uF 10% 16V
C25	1-126-154-11	s ELECT 47uF 20% 6.3V
C26	1-126-154-11	s ELECT 47uF 20% 6.3V
C34	1-131-370-00	s TANTALUM 6.8uF 10% 16V
C35	1-131-370-00	s TANTALUM 6.8uF 10% 16V
C38	1-101-884-00	s CERAMIC 56PF 5% 50V
C41	1-126-160-11	s ELECT 1uF 20% 50V
C44	1-126-163-11	s ELECT 4.7MF 20% 50V
C45	1-126-154-11	s ELECT 47uF 20% 6.3V
C46	1-131-379-00	s TANTALUM 22uF 10% 10V
C47	1-135-165-11	s TANTAL 33uF 10% 16V
C48	1-126-154-11	s ELECT 47uF 20% 6.3V
C49	1-126-154-11	s ELECT 47uF 20% 6.3V
C58	1-131-370-00	s TANTALUM 6.8uF 10% 16V
C59	1-131-370-00	s TANTALUM 6.8uF 10% 16V
C62	1-101-880-00	s CERAMIC 47PF 10% 50V
C64	1-126-160-11	s ELECT 1uF 20% 50V
C67	1-126-154-11	s ELECT 47uF 20% 6.3V
C68	1-163-263-11	s CERAMIC 330PF 5% 50V
C75	1-131-365-00	s TANTALUM 10uF 10% 20V
C76	1-131-365-00	s TANTALUM 10uF 10% 20V
C77	1-131-365-00	s TANTALUM 10uF 10% 20V
C78	1-126-153-11	s ELECT 22uF 20% 6.3V
C79	1-131-341-00	s TANTALUM 0.1uF 10% 35V
C80	1-130-483-00	s MYLAR 0.01uF 5% 50V
C81	1-126-160-11	s ELECT 1uF 20% 50V
C82	1-130-471-00	s MYLAR 0.001uF 5% 50V
C84	1-126-160-11	s ELECT 1uF 20% 50V
C89	1-126-320-11	s ELECT, NONPOLAR 10uF 20% 16V
C90	1-135-168-21	s TANTALUM 100uF 10% 4V
C91	1-126-320-11	s ELECT, NONPOLAR 10uF 20% 16V
C92	1-135-168-21	s TANTALUM 100uF 10% 4V
C93	1-126-320-11	s ELECT, NONPOLAR 10uF 20% 16V
C94	1-135-168-21	s TANTALUM 100uF 10% 4V
C99	1-163-235-11	s CERAMIC 22PF 5% 50V
C100	1-163-235-11	s CERAMIC 22PF 5% 50V
C101	1-163-235-11	s CERAMIC 22PF 5% 50V
C102	1-126-529-11	s ELECT 0.47uF 20% 50V
C103	1-126-529-11	s ELECT 0.47uF 20% 50V
C115	1-163-251-11	s CERAMIC 100PF 5% 50V
C119	1-131-370-00	s TANTALUM 6.8uF 10% 16V
C120	1-131-370-00	s TANTALUM 6.8uF 10% 16V
C121	1-135-215-21	s TANTAL 6.8uF 20% 16V
C125	1-135-165-11	s TANTAL 33uF 10% 16V

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

(VA-121 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C129	1-163-235-11	s	CERAMIC 22PF 5% 50V
C130	1-163-088-00	s	CERAMIC, CHIP 5PF 50V
C133	1-163-235-11	s	CERAMIC 22PF 5% 50V
C134	1-163-088-00	s	CERAMIC, CHIP 5PF 50V
C137	1-163-088-00	s	CERAMIC, CHIP 5PF 50V
C138	1-163-235-11	s	CERAMIC 22PF 5% 50V
C139	1-135-165-11	s	TANTAL 33uF 10% 16V
C140	1-102-965-00	s	CERAMIC 39PF 5% 50V
CN1	1-506-730-11	o	CONNECTOR, 40P, MALE
CV1	1-141-369-22	s	CAP, CHIP TRIMMER
CV2	1-141-369-22	s	CAP, CHIP TRIMMER
CV3	1-141-369-22	s	CAP, CHIP TRIMMER
CV4	1-141-369-22	s	CAP, CHIP TRIMMER
CV5	1-141-369-22	s	CAP, CHIP TRIMMER
CV6	1-141-369-22	s	CAP, CHIP TRIMMER
D1	8-719-948-47	s	DIODE HSM88AS
D3	8-719-800-76	s	DIODE 1SS226
D4	8-719-948-47	s	DIODE HSM88AS
D5	8-719-800-76	s	DIODE 1SS226
D6	8-719-800-76	s	DIODE 1SS226
D7	8-719-948-47	s	DIODE HSM88AS
D8	8-719-800-76	s	DIODE 1SS226
D10	8-719-800-76	s	DIODE 1SS226
D14	8-719-948-47	s	DIODE HSM88AS
D15	8-719-948-47	s	DIODE HSM88AS
D16	8-719-948-47	s	DIODE HSM88AS
FL1	1-409-427-11	s	FILTER, TRAP 14.3MHz
FL2	1-409-427-11	s	FILTER, TRAP 14.3MHz
FL3	1-409-427-11	s	FILTER, TRAP 14.3MHz
IC1	8-759-945-72	s	IC OP-07DPS
IC2	1-807-415-11	s	IC BH-1210
IC3	1-808-806-11	s	IC BH-1262
IC4	8-759-945-72	s	IC OP-07DPS
IC5	1-807-415-11	s	IC BH-1210
IC6	1-808-806-11	s	IC BH-1262
IC7	8-759-945-72	s	IC OP-07DPS
IC8	1-807-415-11	s	IC BH-1210
IC9	1-808-806-11	s	IC BH-1262
IC10	8-759-300-71	s	IC MC14053BF
IC11	8-759-239-34	s	IC TC74HC4538AF
IC13	8-759-906-53	s	IC TL062CPS
IC14	8-759-987-41	s	IC SN74HC4066NS
IC15	8-759-300-71	s	IC MC14053BF
IC16	8-759-906-54	s	IC TL064CNS
IC17	8-759-906-54	s	IC TL064CNS
IC18	8-759-300-71	s	IC MC14053BF
IC19	8-759-906-54	s	IC TL064CNS
IC20	8-759-300-71	s	IC MC14053BF
Q1	8-729-122-63	s	TRANSISTOR 2SA1226
Q2	8-729-122-63	s	TRANSISTOR 2SA1226
Q3	8-729-216-22	s	TRANSISTOR 2SA1162
Q4	8-729-175-73	s	TRANSISTOR 2SC2757
Q5	8-729-109-44	s	TRANSISTOR 2SK94
Q6	8-729-109-44	s	TRANSISTOR 2SK94
Q8	8-729-109-44	s	TRANSISTOR 2SK94
Q9	8-729-109-44	s	TRANSISTOR 2SK94

(VA-121 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q10	8-729-109-44	s	TRANSISTOR 2SK94
Q11	8-729-175-73	s	TRANSISTOR 2SC2757
Q12	8-729-122-63	s	TRANSISTOR 2SA1226
Q13	8-729-122-63	s	TRANSISTOR 2SA1226
Q14	8-729-216-22	s	TRANSISTOR 2SA1162
Q15	8-729-175-73	s	TRANSISTOR 2SC2757
Q16	8-729-109-44	s	TRANSISTOR 2SK94
Q17	8-729-109-44	s	TRANSISTOR 2SK94
Q18	8-729-109-44	s	TRANSISTOR 2SK94
Q19	8-729-109-44	s	TRANSISTOR 2SK94
Q20	8-729-109-44	s	TRANSISTOR 2SK94
Q21	8-729-109-44	s	TRANSISTOR 2SK94
Q22	8-729-175-73	s	TRANSISTOR 2SC2757
Q23	8-729-122-63	s	TRANSISTOR 2SA1226
Q24	8-729-122-63	s	TRANSISTOR 2SA1226
Q25	8-729-216-22	s	TRANSISTOR 2SA1162
Q26	8-729-175-73	s	TRANSISTOR 2SC2757
Q27	8-729-109-44	s	TRANSISTOR 2SK94
Q28	8-729-109-44	s	TRANSISTOR 2SK94
Q29	8-729-109-44	s	TRANSISTOR 2SK94
Q30	8-729-109-44	s	TRANSISTOR 2SK94
Q31	8-729-109-44	s	TRANSISTOR 2SK94
Q32	8-729-175-73	s	TRANSISTOR 2SC2757
Q33	8-729-216-22	s	TRANSISTOR 2SA1162
Q34	8-729-216-22	s	TRANSISTOR 2SA1162
Q35	8-729-216-22	s	TRANSISTOR 2SA1162
Q36	8-729-216-22	s	TRANSISTOR 2SA1162
Q37	8-729-216-22	s	TRANSISTOR 2SA1162
Q40	8-729-216-22	s	TRANSISTOR 2SA1162
Q41	8-729-109-44	s	TRANSISTOR 2SK94
Q42	8-729-100-66	s	TRANSISTOR 2SC1623
Q43	8-729-109-44	s	TRANSISTOR 2SK94
Q44	8-729-100-66	s	TRANSISTOR 2SC1623
R1	1-216-649-11	s	METAL, CHIP 820 0.5% 1/10W
R3	1-216-689-11	s	METAL, CHIP 39K 0.5% 1/10W
R5	1-216-637-11	s	METAL, CHIP 270 0.5% 1/10W
R10	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R11	1-216-699-11	s	METAL, CHIP 100K 0.5% 1/10W
R14	1-216-631-11	s	METAL, CHIP 150 0.5% 1/10W
R15	1-216-665-11	s	METAL, CHIP 3.9K 0.5% 1/10W
R16	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R17	1-216-658-11	s	METAL, CHIP 2K 0.5% 1/10W
R19	1-216-671-11	s	METAL, CHIP 6.8K 0.5% 1/10W
R20	1-216-671-11	s	METAL, CHIP 6.8K 0.5% 1/10W
R33	1-216-645-11	s	METAL, CHIP 560 0.5% 1/10W
R35	1-216-699-11	s	METAL, CHIP 100K 0.5% 1/10W
R39	1-216-649-11	s	METAL, CHIP 820 0.5% 1/10W
R40	1-216-689-11	s	METAL, CHIP 39K 0.5% 1/10W
R42	1-216-643-11	s	METAL, CHIP 470 0.5% 1/10W
R44	1-216-699-11	s	METAL, CHIP 100K 0.5% 1/10W
R49	1-216-631-11	s	METAL, CHIP 150 0.5% 1/10W
R50	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R51	1-216-665-11	s	METAL, CHIP 3.9K 0.5% 1/10W
R52	1-216-658-11	s	METAL, CHIP 2K 0.5% 1/10W
R54	1-216-671-11	s	METAL, CHIP 6.8K 0.5% 1/10W
R56	1-216-671-11	s	METAL, CHIP 6.8K 0.5% 1/10W
R66	1-216-645-11	s	METAL, CHIP 560 0.5% 1/10W
R73	1-216-699-11	s	METAL, CHIP 100K 0.5% 1/10W

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

(VA-121 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R77	1-216-603-11	s METAL, CHIP 10 0.5% 1/10W
R78	1-216-649-11	s METAL, CHIP 820 0.5% 1/10W
R79	1-216-603-11	s METAL, CHIP 10 0.5% 1/10W
R81	1-216-627-11	s METAL, CHIP 100 0.5% 1/10W
R83	1-216-689-11	s METAL, CHIP 39K 0.5% 1/10W
R88	1-216-631-11	s METAL, CHIP 150 0.5% 1/10W
R89	1-216-635-11	s METAL, CHIP 220 0.5% 1/10W
R90	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R91	1-216-658-11	s METAL, CHIP 2K 0.5% 1/10W
R93	1-216-671-11	s METAL, CHIP 6.8K 0.5% 1/10W
R95	1-216-671-11	s METAL, CHIP 6.8K 0.5% 1/10W
R107	1-216-645-11	s METAL, CHIP 560 0.5% 1/10W
R109	1-216-699-11	s METAL, CHIP 100K 0.5% 1/10W
R122	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R127	1-216-679-11	s METAL, CHIP 15K 0.5% 1/10W
R132	1-216-679-11	s METAL, CHIP 15K 0.5% 1/10W
R138	1-216-679-11	s METAL, CHIP 15K 0.5% 1/10W
R154	1-216-110-00	s METAL 360K 0.50% 1/10W
R178	1-216-699-11	s METAL, CHIP 100K 0.5% 1/10W
R217	1-216-691-11	s METAL, CHIP 47K 0.5% 1/10W
R240	1-216-697-11	s METAL, CHIP 82K 0.5% 1/10W
R242	1-216-685-11	s METAL, CHIP 27K 0.5% 1/10W
R243	1-216-654-11	s METAL, CHIP 1.3K 0.5% 1/10W
R272	1-216-697-11	s METAL, CHIP 82K 0.5% 1/10W
RV1	1-228-473-00	s RES, ADJ, METAL 5K
RV2	1-228-471-00	s RES, ADJ, METAL 1K
RV3	1-228-460-00	s RES, ADJ, METAL 20K
RV4	1-228-459-00	s RES, ADJ, METAL 10K
RV5	1-228-474-00	s RES, ADJ, METAL 10K
RV6	1-228-471-00	s RES, ADJ, METAL 1K
RV7	1-228-460-00	s RES, ADJ, METAL 20K
RV8	1-228-459-00	s RES, ADJ, METAL 10K
RV9	1-228-474-00	s RES, ADJ, METAL 10K
RV10	1-228-471-00	s RES, ADJ, METAL 1K
RV11	1-228-460-00	s RES, ADJ, METAL 20K
RV12	1-228-459-00	s RES, ADJ, METAL 10K
RV13	1-228-475-00	s RES, ADJ, METAL 20K
RV14	1-228-475-00	s RES, ADJ, METAL 20K
RV15	1-228-475-00	s RES, ADJ, METAL 20K
RV16	1-228-462-00	s RES, ADJ, METAL 100K
RV17	1-228-462-00	s RES, ADJ, METAL 100K
RV18	1-228-462-00	s RES, ADJ, METAL 100K
RV19	1-228-462-00	s RES, ADJ, METAL 100K
RV20	1-228-462-00	s RES, ADJ, METAL 100K
RV21	1-228-462-00	s RES, ADJ, METAL 100K
RV22	1-228-462-00	s RES, ADJ, METAL 100K
RV23	1-228-462-00	s RES, ADJ, METAL 100K
RV24	1-228-462-00	s RES, ADJ, METAL 100K
RV25	1-228-462-00	s RES, ADJ, METAL 100K
RV26	1-228-462-00	s RES, ADJ, METAL 100K
RV27	1-228-462-00	s RES, ADJ, METAL 100K
RV28	1-228-457-00	s RES, ADJ, METAL 2K
RV29	1-228-457-00	s RES, ADJ, METAL 2K
RV30	1-228-457-00	s RES, ADJ, METAL 2K
RV31	1-228-462-00	s RES, ADJ, METAL 100K
RV32	1-228-462-00	s RES, ADJ, METAL 100K
RV33	1-228-462-00	s RES, ADJ, METAL 100K
RV34	1-228-462-00	s RES, ADJ, METAL 100K
RV35	1-228-462-00	s RES, ADJ, METAL 100K

(VA-121 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
RV36	1-228-462-00	s RES, ADJ, METAL 100K
RV38	1-228-462-00	s RES, ADJ, METAL 100K
RV39	1-228-462-00	s RES, ADJ, METAL 100K
RV40	1-228-462-00	s RES, ADJ, METAL 100K
RV43	1-228-460-00	s RES, ADJ, METAL 20K
RV45	1-228-460-00	s RES, ADJ, METAL 20K
RV46	1-228-460-00	s RES, ADJ, METAL 20K
RV49	1-237-034-11	s RES, ADJ, METAL 2K
RV51	1-237-034-11	s RES, ADJ, METAL 2K
RV52	1-228-464-00	s RES, ADJ, METAL 500K
RV53	1-228-464-00	s RES, ADJ, METAL 500K
RV54	1-228-464-00	s RES, ADJ, METAL 500K
S1	1-570-857-11	s SWITCH, SLIDE
S2	1-570-610-11	s SWITCH, TOGGLE

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

VF-41 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7520-475-A	o MOUNTED CIRCUIT BOARD, VF-41
C1	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C2	1-135-125-21	s TANTALUM, CHIP 33uF 20% 10V
C4	1-135-155-21	s TANTAL CHIP 4.7uF 10% 16V
C8	1-163-115-00	s CERAMIC, CHIP 82PF 5% 50V
C13	1-131-374-00	s TANTALUM 33uF 10% 16V
C14	1-131-374-00	s TANTALUM 33uF 10% 16V
C15	1-136-534-11	s FILM 0.0027uF 5% 100V
C16	1-136-287-11	s FILM 0.0047uF 5% 100V
C21	1-164-350-11	s CERAMIC 470PF 10% 1KV
C22	1-126-233-11	s ELECT 22uF 20% 50V
C23	1-163-833-00	s CERAMIC, CHIP 0.068uF 25V
C24	1-131-365-00	s TANTALUM 10uF 10% 20V
C25	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C26	1-135-076-21	s TANTALUM, CHIP 1uF 10% 35V
C27	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C30	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C31	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C33	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C34	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C35	1-136-287-11	s FILM 0.0047uF 5% 100V
C37	1-163-037-11	s CERAMIC, CHIP 0.022uF 10% 25V
C38	1-135-076-21	s TANTALUM, CHIP 1uF 10% 35V
C39	1-135-076-21	s TANTALUM, CHIP 1uF 10% 35V
C41	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C42	1-135-092-21	s TANTALUM, CHIP 3.3uF 10% 16V
C45	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C46	1-126-176-11	s ELECT 220uF 20% 10V
C47	1-124-455-00	s ELECT 100uF 20% 16V
C51	1-163-018-00	s CERAMIC, CHIP 0.0056uF 5% 50V
CN1	1-566-395-11	o CONNECTOR, 10P, MALE
CN2	1-566-391-11	o CONNECTOR 12P
CN4	1-506-470-11	o CONNECTOR, 5P, MALE
CN5	1-506-470-11	o CONNECTOR, 5P, MALE
CV1	1-141-370-11	s CAP, CHIP TRIMMER
D1	8-719-914-11	s DIODE HZ4ALL
D2	8-719-800-76	s DIODE 1SS226
D3	8-719-900-95	s DIODE V09G
D5	8-719-901-19	s DIODE V11N
D6	8-719-900-95	s DIODE V09G
D7	8-719-400-18	s DIODE MA152WK
D8	8-719-400-18	s DIODE MA152WK
D9	8-719-800-76	s DIODE 1SS226
D10	8-719-800-76	s DIODE 1SS226
D11	8-719-400-18	s DIODE MA152WK
D12	8-719-910-75	s DIODE HZ7B2L
D13	8-719-104-34	s DIODE 1S2836
DL1	1-415-487-11	s DELAY LINE 140ns
IC1	8-759-300-28	s IC HA11423MP
IC2	8-759-100-94	s IC UPC358G2
IC3	8-759-209-57	s IC TC4S69F
IC4	8-759-209-54	s IC TC4S01F
L2	1-459-899-11	s COIL, HORIZONTAL LINEARITY
L3	1-410-716-31	s INDUCTOR CHIP 82uH
Q1	8-729-175-72	s TRANSISTOR 2SC2757-T33

(VF-41 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
Q2	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q3	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q4	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q5	8-729-100-66	s TRANSISTOR 2SC1623
Q6	8-729-105-37	s TRANSISTOR 2SC3360
Q7	8-729-100-66	s TRANSISTOR 2SC1623
Q8	8-729-119-00	s TRANSISTOR 2SK612
Q9	8-729-119-00	s TRANSISTOR 2SK612
Q10	8-729-105-37	s TRANSISTOR 2SC3360
Q11	8-729-100-66	s TRANSISTOR 2SC1623
Q12	8-729-216-22	s TRANSISTOR 2SA1162
Q13	8-729-175-72	s TRANSISTOR 2SC2757-T33
Q14	8-729-100-66	s TRANSISTOR 2SC1623
Q15	8-729-216-22	s TRANSISTOR 2SA1162
Q16	8-729-141-48	s TRANSISTOR 2SB624-BV345
Q17	8-729-109-44	s TRANSISTOR 2SK94
Q18	8-729-216-22	s TRANSISTOR 2SA1162
R3	1-216-687-11	s METAL, CHIP 33K 0.5% 1/10W
R4	1-216-683-11	s METAL, CHIP 22K 0.5% 1/10W
R5	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R6	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R8	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R10	1-216-657-11	s METAL, CHIP 1.8K 0.5% 1/10W
R11	1-216-689-11	s METAL, CHIP 39K 0.5% 1/10W
R12	1-216-683-11	s METAL, CHIP 22K 0.5% 1/10W
R14	1-216-637-11	s METAL, CHIP 270 0.5% 1/10W
R15	1-216-671-11	s METAL, CHIP 6.8K 0.5% 1/10W
R16	1-216-639-11	s METAL, CHIP 330 0.5% 1/10W
R17	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R19	1-216-667-11	s METAL, CHIP 4.7K 0.5% 1/10W
R20	1-216-645-11	s METAL, CHIP 560 0.5% 1/10W
R22	1-216-657-11	s METAL, CHIP 1.8K 0.5% 1/10W
R23	1-216-673-11	s METAL, CHIP 8.2K 0.5% 1/10W
R25	1-216-683-11	s METAL, CHIP 22K 0.5% 1/10W
R26	1-216-667-11	s METAL, CHIP 4.7K 0.5% 1/10W
R27	1-216-667-11	s METAL, CHIP 4.7K 0.5% 1/10W
R28	1-216-667-11	s METAL, CHIP 4.7K 0.5% 1/10W
R29	1-214-520-00	s METAL FILM 30 1% 1/8W
R32	1-216-698-11	s METAL, CHIP 91K 0.5% 1/10W
R43	1-216-669-11	s METAL, CHIP 5.6K 0.5% 1/10W
R46	1-215-490-00	s METAL 750K 1% 1/6W
R79	1-216-681-11	s METAL, CHIP 18K 0.5% 1/10W
R81	1-216-683-11	s METAL, CHIP 22K 0.5% 1/10W
R82	1-216-683-11	s METAL, CHIP 22K 0.5% 1/10W
R85	1-216-668-11	s METAL, CHIP 5.1K 0.5% 1/10W
R86	1-216-693-11	s METAL, CHIP 56K 0.5% 1/10W
R87	1-216-659-11	s METAL, CHIP 2.2K 0.5% 1/10W
R91	1-216-627-11	s METAL, CHIP 100 0.5% 1/10W
R92	1-216-627-11	s METAL, CHIP 100 0.5% 1/10W
R93	1-216-644-11	s METAL, CHIP 510 0.5% 1/10W
R97	1-208-259-00	s MICRO (OHM) 10M
RV1	1-237-035-11	s RES, ADJ, METAL 5K
RV2	1-237-035-11	s RES, ADJ, METAL 5K
RV3	1-237-035-11	s RES, ADJ, METAL 5K
RV4	1-237-041-11	s RES, ADJ, METAL 500K
RV5	1-237-035-11	s RES, ADJ, METAL 5K
RV6	1-237-031-11	s RES, ADJ, METAL 200
RV7	1-237-032-11	s RES, ADJ, METAL 500

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

(VF-41 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
RV8	1-237-032-11 s	RES, ADJ, METAL 500
RV9	1-237-038-11 s	RES, ADJ, METAL 50K
T1	A1-439-419-11 s	TRANSFORMER, FLYBACK
VDR1	1-806-497-00 s	VARISTOR ERZ-C05DK220

VR-108 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-7520-476-A o	MOUNTED CIRCUIT BOARD, VR-108
C6	1-131-349-00 s	TANTALUM 2.2uF 10% 35V
C7	1-135-092-21 s	TANTALUM, CHIP 3.3uF 10% 16V
C8	1-163-037-11 s	CERAMIC, CHIP 0.022uF 10% 25V
C9	1-124-584-00 s	ELECT 100uF 20% 10V
CN23	1-506-485-11 o	CONNECTOR, 6P, MALE
IC1	8-759-801-06 s	IC LB1423N
Q1	8-729-901-03 s	TRANSISTOR DTC144WK
Q2	8-729-901-03 s	TRANSISTOR DTC144WK
Q3	8-729-901-03 s	TRANSISTOR DTC144WK
Q4	8-729-901-03 s	TRANSISTOR DTC144WK
R15	1-216-691-11 s	METAL, CHIP 47K 0.5% 1/10W
RV1	1-238-296-11 s	RES, VAR, CARBON 10K
RV2	1-238-296-11 s	RES, VAR, CARBON 10K
RV3	1-238-290-11 s	RES, VAR, CARBON 1K
RV4	1-238-293-11 s	RES, VAR, CARBON 10K
RV5	1-228-473-00 s	RES, ADJ, METAL 5K

MAIN FRAME

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-547-259-11 o	FILTER UNIT, OPTICAL
1pc	1-937-212-31 o	HARNESS (VF)
1pc	1-937-218-11 o	HARNESS (LENS)
1pc	1-939-723-15 o	HARNESS (50P PC BOARD TYPE)
1pc	8-759-720-83 s	IC AT27C256R-15RC
1pc	8-759-947-34 s	IC LM35DZ
CN1F (to PA-135 board)	1-569-199-11 o	PLUG HOUSING, 6P
	1-569-194-11 o	CONTACT, FEMALE AWG24-30
CN1F (to RG-25/25P board)	1-562-147-11 s	HOUSING, 2P
	1-563-088-11 o	CONTACT, FEMALE, AWG24-30
CN1F (to RG-26/26P board)	1-565-123-11 s	HOUSING, 4P
	1-565-164-11 o	CONTACT, FEMALE, AWG26-32
CN1F (to SW-115A board)	1-562-748-11 s	HOUSING, 15P
	1-563-088-11 o	CONTACT, FEMALE, AWG24-30
CN1F (to SW-116 board)	1-562-150-11 s	HOUSING, 5P
	1-563-088-11 o	CONTACT, FEMALE, AWG24-30
CN1F (to SW-256 board)	1-569-198-11 o	PLUG HOUSING, 5P
	1-569-194-11 o	CONTACT, FEMALE AWG24-30
CN1F (to SW-481 board)	1-569-203-11 o	HOUSING, 10P
	1-569-194-11 o	CONTACT, FEMALE AWG24-30
CN2F (to CN-189 board)	1-562-743-11 o	HOUSING, 10P
CN2F (to TG-57/57P board)	1-569-197-21 o	HOUSING, CONNECTOR 4P
	1-569-194-11 o	CONTACT, FEMALE AWG24-30
CN2F (to SW-481 board)	1-565-129-11 o	HOUSING, 10P
	1-569-194-11 o	CONTACT, FEMALE AWG24-30
CN3F (to AT-52 board)	1-569-199-11 o	PLUG HOUSING, 6P
	1-569-194-11 o	CONTACT, FEMALE AWG24-30
CN3F (to DR-86 board)	1-569-200-11 o	HOUSING, CONNECTOR 7P
	1-569-194-11 o	CONTACT, FEMALE AWG24-30
CN3F (to RG-25/25P board)	1-562-156-11 o	HOUSING, 11P
	1-563-088-11 o	CONTACT, FEMALE, AWG24-30
CN3F (to TG-57/57P board)	1-562-148-11 s	HOUSING, 3P
	1-563-088-11 o	CONTACT, FEMALE, AWG24-30
CN3F (to SW-481 board)	1-565-123-11 o	HOUSING, 4P
	1-565-164-11 o	CONTACT, FEMALE AWG26-32
CN4F (to AT-52A board)	1-562-148-11 s	HOUSING, 3P
	1-563-088-11 o	CONTACT, FEMALE, AWG24-30
CN4F (to RG-25/25P board)	1-569-195-11 o	HOUSING, CONNECTOR 2P
	1-569-194-11 o	CONTACT, FEMALE AWG24-30
CN4F (to TG-57/57P board)	1-569-203-11 o	HOUSING, CONNECTOR 10P
	1-569-194-11 o	CONTACT, FEMALE AWG24-30
CN4F (to SW-481 board)	1-565-123-11 o	HOUSING, 4P
	1-565-164-11 o	CONTACT, FEMALE AWG26-32

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

(MAIN FRAME)

Ref. No.
or Q'ty Part No. SP Description

CN5F (to RG-25/25P board)
1-565-123-11 o HOUSING, 4P
1-565-164-11 o CONTACT, FEMALE AWG26-32

CN8F (to HN-135 board)
1-563-120-11 o HOUSING, PS 12P
1-563-115-11 o CONTACT, FEMALE AWG24-28

CN8F (to TG-57/57P board)
1-569-196-41 o HOUSING, CONNECTOR 3P
1-569-194-11 o CONTACT, FEMALE AWG24-30

CN9F (to HN-135 board)
1-562-156-11 o HOUSING, 11P
1-563-088-11 o CONTACT, FEMALE, AWG24-30

CN10F (to HN-135 board)
1-562-148-11 s HOUSING, 3P
1-563-088-11 o CONTACT, FEMALE, AWG24-30

CN11F (to HN-135 board)
1-569-197-21 o PLUG HOUSING, 4P
1-569-194-11 o CONTACT, FEMALE AWG24-30

CN12F (to HN-135 board)
1-569-198-11 o PLUG HOUSING, 5P
1-569-194-11 o CONTACT, FEMALE AWG24-30

CN13F (to HN-135 board)
1-562-155-11 o HOUSING, 10P
1-563-088-11 o CONTACT, FEMALE, AWG24-30

CN14F (to HN-135 board)
1-562-149-11 o HOUSING, 4P
1-563-088-11 o CONTACT, FEMALE, AWG24-30

CN15F (to HN-135 board)
1-562-157-11 o HOUSING, 12P
1-563-088-11 o CONTACT, FEMALE, AWG24-30

CN16F (to HN-135 board)
1-562-150-21 o HOUSING, 5P
1-563-088-11 o CONTACT, FEMALE, AWG24-30

CN17F (to HN-135 board)
1-562-150-11 o HOUSING, 5P
1-563-088-11 o CONTACT, FEMALE, AWG24-30

CN18F (to HN-135 board)
1-562-147-11 s HOUSING, 2P
1-563-088-11 o CONTACT, FEMALE, AWG24-30

CN20F (to HN-135 board)
1-563-124-11 o HOUSING, 20P
1-563-115-11 o CONTACT, FEMALE AWG24-28

CN21F (to HN-135 board)
1-569-206-11 o HOUSING, CONNECTOR 13P
1-569-194-11 o CONTACT, FEMALE AWG24-30

CN22F (to HN-135 board)
1-569-199-11 o PLUG HOUSING, 6P
1-569-194-11 o CONTACT, FEMALE AWG24-30

CN23F (to HN-135 board)
1-569-197-11 o PLUG HOUSING, 4P
1-569-194-11 o CONTACT, FEMALE AWG24-30

CN24F (to HN-135 board)
1-562-148-11 s HOUSING, 3P
1-563-088-11 o CONTACT, FEMALE, AWG24-30

(MAIN FRAME)

Ref. No.
or Q'ty Part No. SP Description

CN27F (to HN-135 board)
1-563-123-11 o HOUSING, PS 18P
1-563-115-11 o CONTACT, FEMALE AWG24-28

CN101 1-565-051-11 o CONNECTOR, 20P FEMALE "VF"
CN102 1-562-221-21 s CONNECTOR, 12P FEMALE "LENS"
CN103 1-562-261-21 o CONNECTOR, BNC "TEST OUT"
CN105 1-561-233-21 s CONNECTOR, 6P FEMALE "REMOTE"

RV101 1-223-165-00 s RES, ADJ, WIREWOUND 10K "PEDESTAL"

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

VIEWFINDER FRAME

Ref. No.
or Q'ty Part No. SP Description

1pc 1-542-106-11 s MICROPHONE
1pc A1-546-066-22 s 1.5" CRT ASSY
1pc 1-940-868-12 s HARNESS (VF CABLE)

CN1F(to LP-56 board)
1-565-121-11 o HOUSING, 2P
1-564-832-11 o CONTACT, FEMALE, AWG24-30

CN1F(to SW-425 board)
1-563-871-11 o HOUSING, 6P
1-563-869-11 o CONTACT, FEMALE, AWG26-30

CN1F(to VF-41 board)
1-563-873-11 o HOUSING, 10P
1-563-869-11 o CONTACT, FEMALE, AWG26-30

CN2F(to VF-41 board)
1-563-874-11 o HOUSING, 12P
1-563-869-11 o CONTACT, FEMALE, AWG26-30

CN4F(to VF-41 board)
1-562-150-11 o HOUSING, 5P
1-564-026-21 o CONTACT, FEMALE, AWG26-30

CN5F(to VF-41 board)
1-562-150-11 o HOUSING, 5P
1-564-026-21 o CONTACT, FEMALE, AWG26-30

CN11F(to CN-440 board)
1-563-877-11 o HOUSING, 18P
1-563-869-11 o CONTACT, FEMALE, AWG26-30

CN13F(to CN-440 board)
1-563-873-11 o HOUSING, 10P
1-563-869-11 o CONTACT, FEMALE, AWG26-30

CN14F(to VR-108 board)
1-563-872-11 o HOUSING, 8P
1-563-869-11 o CONTACT, FEMALE, AWG26-30

CN23F(to VR-108 board)
1-562-151-11 o HOUSING, 6P
1-563-088-11 o CONTACT, FEMALE, AWG24-30

CN102F(to MICROPHONE)
1-562-151-11 o HOUSING, 6P
1-563-088-11 o CONTACT, FEMALE, AWG24-30

PACKING MATERIALS & SUPPLIED ACCESSORIES

Ref. No.
or Q'ty Part No. SP Description

(FOR BVP-7A)
1pc A-7520-253-A o MOUNTED CIRCUIT BOARD, EX-108
1pc X-3710-001-3 o LID ASSY, UPPER
2pcs 3-657-705-00 s BOLT (MX40), HEXAGON HOLE
2pcs 3-687-116-01 o WASHER (4), STOPPER

1pc 3-675-930-00 s CAP (50P PIN SIDE), DUST
1pc 3-692-589-01 s TOOL
1pc 3-711-780-01 s COVER, RAIN
1pc 3-717-823-01 s COVER, BNC
1pc 3-720-955-02 s LID, VF MICROPHONE

1pc 7-721-140-60 s WRENCH, L (3.0MM)

(FOR BVW-507A)
1pc A-6772-374-A o BELT ASSY, SHOULDER
1pc A-7520-253-A o MOUNTED CIRCUIT BOARD, EX-108
1pc X-3710-001-3 o LID ASSY, UPPER
2pcs 3-657-705-00 s BOLT (MX40), HEXAGON HOLE

2pcs 3-687-116-01 o WASHER (4), STOPPER
1pc 3-675-930-00 s CAP (50P PIN SIDE), DUST
1pc 3-676-269-00 s CAP (SOCKET SIDE), DUST
1pc 3-692-589-01 s TOOL
1pc 3-711-780-01 s COVER, RAIN

4pcs 3-717-823-01 s COVER, BNC
2pcs 3-718-047-01 s CAP, 4P DROP PROTECTION
1pc 3-720-955-02 s LID, VF MICROPHONE
2pcs 7-682-559-09 s SCREW +B 4X5
1pc 7-721-140-60 s WRENCH, L (3.0MM)

Please see pages D-17 and D-18 for the part numbers of capacitors and resistors that are not listed in the parts list.

SECTION D

SPARE PARTS

PARTS INFORMATION

1. Safety Related Component Warning

Components identified by shading marked with  on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service manual supplements published by Sony.

2. Replacement Parts supplied from Sony Parts Center will sometimes have different shape and outside view from the parts which actually in use. This is due to **"accommodating the improved parts and/or engineering changes" or "standardization of genuine parts."** This manual's exploded view and electrical spare parts lists are indicating the parts numbers of "the standardized genuine parts at present." Regarding engineering parts and diagrams changes in our engineering department, refer SECTION 9 CHANGE INFORMATION.
3. The parts marked with "S" in the SP column of the exploded views and electrical spare parts list are normally required for routine service work. Orders for parts marked with "O" will be processed, but allow for additional delivery time.
4. Item with no parts number and/or no description are not stocked because they are seldom required for routine service.
5. All capacitors are in micro farads unless otherwise specified.
All inductors are in micro henries unless otherwise specified.
All resistors are in ohms.

 FRONT ASSY

No.	Part No.	SP Description
1	A-7520-249-B	o MOUNTED CIRCUIT BOARD, SW-114
2	A-7575-158-A	s CCD UNIT-P7A (N) (J,UC)
3	A-7575-159-A	s CCD UNIT-P7AP (P) (EK)
4	A-7612-355-C	s PANEL ASSY, FRONT
5	1-547-259-11	o FILTER UNIT, OPTICAL
6	1-554-395-11	s SWITCH, TOGGLE "AUTO W/B BAL"
7	1-618-177-11	o PRINTED CIRCUIT BOARD, SW-116
8	2-623-773-11	s BOLT (M3X8), STAINLESS
9	1-552-539-11	s SWITCH, KEYBOARD "VTR START"
10	3-168-894-01	o STAY (T), FRONT
11	3-678-629-00	s LEVER, MOUNT
12	3-678-684-00	o HOLDER, CABLE
13	3-699-048-01	s CAP, MOUNT
14	3-701-505-00	s SET SCREW, DOUBLE POINT 3X3
15	3-710-024-01	o PACKING, VF
16	3-710-054-01	s KNOB, FILTER
17	3-711-705-01	o CAP, DROP PROTECTION
18	3-711-714-11	o SPRING
19	3-711-715-01	o RUBBER, SHIELD
20	3-711-757-01	o SUPPORT
21	3-734-513-01	s GUARD (F2), SWITCH
22	3-734-517-04	s RUBBER, VTR START STOP